



## ARLINGTON COUNTY, VIRGINIA

### County Board Agenda Item Meeting of September 15, 2012

**DATE:** August 29, 2012

**SUBJECT:** U-3340-12-1 USE PERMIT to allow a 50' telecommunications pole with accompanying equipment shelter for New Cingular Wireless d/b/a AT&T Mobility; located near Jefferson Davis Highway and Washington Boulevard (RPC# 34-036-001 and 34-666-MET).

**Applicant:**

The New Cingular Wireless d/b/a AT&T Mobility

**By:**

Paul Whitley, Agent  
7380 Coca Cola Drive, Suite 106  
Hanover, Maryland 21076

**C.M. RECOMMENDATION:**

Approve the subject use permit, subject to the conditions of the staff report, and with a County Board review in one (1) year (September 2013).

**ISSUES:** This is a use permit request for a 50' tall telecommunications pole located within Washington Metropolitan Area Transit Authority (WMATA) property with accompanying equipment for New Cingular Wireless (d/b/a AT&T Mobility), and no issues have been identified.

**SUMMARY:** New Cingular Wireless (d/b/a AT&T Mobility) is requesting a use permit to allow a 50' tall telecommunications pole with accompanying equipment shelter. Staff supports the applicant's proposal for a 50' tall telecommunications pole since there is heavy tree cover surrounding the site. The pole would only be noticeable when driving along Jefferson Davis Highway (Route 110). The telecommunications pole will accommodate up to twelve (12) antennas at a radial center (RAD center) of 50'. The proposed equipment shelter will measure 11.4' x 20' on top of an existing 926 sq. ft. platform area, and will be 10' from grade to the top of the shelter. The telecommunications pole and equipment shelter meet the setback and height

County Manager:

*BMD/GA*

County Attorney:

*AM*                      *CRM*

Staff: Marco Antonio Rivero, DCPHD, Planning Division

PLA-6266

12.

requirements for the site as specified in [Arlington County Zoning Ordinance \(ACZO\) Section 32.D.1.d.](#) and [ACZO Section 31.B.2.e.](#)

The proposed equipment shelter will not be visible to pedestrians, only to vehicular traffic, and will be contained within WMATA property. The [Interim Guidelines for Placement of Telecommunications Facilities on County-Owned Property \(Telecommunications Guidelines\)](#) were used to evaluate the application. Staff has reviewed these criteria with the applicant and the proposed facility meets these guidelines. The Aurora Highlands Civic Association does not object to this use permit request and other relevant federal and state agencies support the applicant's request for a use permit. Therefore, staff recommends that the County Board approve the subject use permit, subject to the proposed conditions, and with a County Board review in one (1) year (September 2013).

**BACKGROUND:** The County Board deferred acting on this use permit at the May 2012 County Board meeting. The original use permit request was for a 60' stealth telecommunications pole with accompanying equipment next to an existing Washington Metropolitan Area Transit Authority (WMATA) transformer station. The site is located on WMATA property and governed by the [WMATA Compact](#). The proposed pole would have been designed to look like a tree pole with faux leaves screening the twelve (12) telecommunications antennae and other fixtures at the top with branches that resemble an evergreen tree. By request of Arlington National Cemetery and the United States Department of the Interior, National Park Service, New Cingular Wireless reduced the height of the telecommunications pole. For New Cingular Wireless' telecommunications purposes, it would require at least a 50' exposed antenna telecommunications pole to obtain the same coverage as a 60' stealth pole. Staff supports the change since there is heavy tree cover surrounding the site, and the 50' telecommunications pole would not be noticeable at greater distances and will only be noticeable when driving along Jefferson Davis Highway (Route 110).

During the initial review of the use permit, staff identified areas where more information was needed from the applicant in order to thoroughly evaluate the proposal. The information included identifying in more detail the landscaping/screening options for the site, as well as verifying compliance with Federal Communications Commission (FCC) standards by providing an Electromagnetic Energy Measurement and Site Compliance (EME) report. The County Board deferred acting on this use permit again at the July 2012 County Board meeting in order to allow the application to be re-advertised to include additional parcels to address setback requirements. Both the proposed telecommunications pole and equipment shelter would meet the setback requirements to the property line of the combined parcel and the height requirements as specified in [ACZO Section 31.B.2.e](#) for the telecommunications pole.

**The following provides additional information about the site and location:**

Site: The site is located at a WMATA transformer station area between the Arlington National Cemetery and Pentagon Metro Stations bound on the west by Arlington National Cemetery and Jefferson Davis Highway (Route 110), on the south by the Pentagon, on the north by the George Washington Memorial Parkway and on the east by the Pentagon North parking lot.

Zoning: The site is zoned [“S-3A” Special Districts](#).

Land Use: The site is designated on the [General Land Use Plan \(GLUP\)](#) as “Public” (Parks. Schools. Parkways, major unpaved rights-of-way. Libraries and cultural facilities).

Neighborhood: The site is not located within the boundaries of a civic association but is closest to the Aurora Highlands Civic Association boundary, which is located approximately one (1) mile from the WMATA property. The Aurora Highlands Civic Association has no objection to the proposed use permit request. Furthermore, the Arlington National Cemetery, the United States Department of the Interior, National Parks Service, WMATA, and the Commonwealth of Virginia Department of Historic Resources Office have reviewed the application and supported the request to seek a special use permit. The Crystal City Business Improvement District was also contacted, but no comments have been received as of the writing of this report.



Source: Bing™ Maps

**Location of Proposed New Cingular Wireless d/b/a AT&T Mobility Telecommunications Pole: Approximate to Intersection of Jefferson Davis Hwy and Washington Blvd**

**DISCUSSION:** This is a use permit request to allow a 50’ tall telecommunications pole with accompanying equipment shelter for New Cingular Wireless d/b/a AT&T Mobility. This use permit request was deferred from the May 2012 County Board meeting because the applicant needed to provide details on proposed landscaping for the site and an EME report showing FCC

compliance and to allow the application to be re-advertised to include additional parcels. The applicant has since provided this information.

The proposed telecommunications pole will be 50' tall measured from existing grade to the top of the pole. The proposed triangular mount will contain up to twelve (12) antennas, four (4) on each sector. At this time, the applicant is proposing to install only nine (9) antennas, three (3) on each sector mounted at a radiation center (RAD center) of 50'. The remaining antennas will be added at a later date. Antennas will be designed to match the appearance and color of the proposed telecommunications pole. The proposed equipment shelter will measure 11.4' x 20' on top of an existing 926 sq. ft. platform area, and will be 10' from grade to the top of the shelter. The existing WMATA transformer station varies from height ranging from 14' to 20'. The telecommunications pole and equipment shelter meet the setback requirements for the site as specified in [ACZO Section 32.D.1.d](#). The proposed equipment shelter will not be visible to pedestrians, only to vehicular traffic and will not encroach on the existing right-of-way. A protective chain link fence separates the train tracks from the rest of the site. Furthermore, the equipment shelter will be painted and built to match the appearance of the existing transformer station.

Landscaping: Staff requested that the applicant provide further details regarding landscaping for the site. The applicant has agreed to install landscaping on the perimeter of the property, primarily in the areas surrounding the proposed telecommunications pole and equipment shelter. Examples include at least ten (10) Eastern Red Cedar trees and eight (8) Eastern White Pine trees at 8' to 10' tall at planting. These additions will provide the necessary screening needed to shield the proposed equipment shelter and other ground equipment needed for the proposed telecommunications pole. Condition #4 will require that the applicant submit a landscape plan showing these improvements to the site, and any modifications to the proposed landscape plan shall be subject to review, and approval, by the Zoning Administrator.

EME Report: The applicant submitted an Electromagnetic Energy Measurement and Site Compliance report (EME report) which demonstrates that the exposure to radio frequency (RF) emissions from an observation height of 7' off ground level. The telecommunications pole is not expected to create an adverse impact to the health and safety of individuals at or near the site. No pedestrians will have access to the site and there are no nearby buildings or ground level locations within the range of the maximum permissible exposure (MPE) limits. The facility will be unmanned with no customers or employees running the site except for maintenance purposes, typically once a month. The report demonstrates that the site will be compliant with Federal Communications Commission (FCC) regulations. Federal law prohibits localities from basing a decision on the environmental effects of radio frequency emissions if the facility complies with FCC regulations.

The [Interim Guidelines for Placement of Telecommunications Facilities on County-Owned Property \(Telecommunications Guidelines\)](#) were used to evaluate the application. The *Telecommunication Guidelines* offer direction in the way of design of the monopole and equipment structure, landscaping, co-location, and compliance with Federal Communications Commission (FCC) regulations, among other things. The *Telecommunication Guidelines* can be applied to telecommunication facilities on privately-owned property as well as County-owned.

The *Telecommunications Guidelines* encourage the location of new antennas on existing structures, as opposed to constructing a new pole. When a new telecommunications pole is considered, certain criteria need to be met for its consideration. Staff has reviewed these criteria with the applicant and the proposed facility meets these guidelines which include: detailed drawings/cross sections of the proposed facility, a landscape plan for the area, confirmation that the applicant agrees to collocate with future providers, and naming a community liaison that shall be available to address any concerns regarding the facility operation. Attached are plans depicting the location and general appearance of the proposed telecommunications pole, associated antennas, and equipment shelter.

The proposed telecommunications facility will be compliant with the requirements specified in the ACZO. The use is permitted under [ACZO Section 3.A.10.b.](#) and the telecommunications pole and equipment shelter meet the setback requirements for the site as specified in [ACZO Section 32.D.1.d.](#) as well as the height requirements as specified in [ACZO Section 31.B.2.e](#) for the telecommunications pole.

**CONCLUSION:** The proposed telecommunications facility does not conflict with the County's General Land Use Plan. Staff supports the placement of the proposed equipment shelter since its placement will match the placement of an existing, adjacent WMATA transformer station. The proposed equipment shelter will not be visible to a walking pedestrian, only to vehicular traffic and will not encroach on the existing right-of-way. The telecommunications pole will not create an undue, adverse visual impact to the site since there is heavy tree cover surrounding the site, and the 50' telecommunications pole would not be noticeable at longer distances except when driving along Jefferson Davis Highway. Furthermore, the applicant has provided an EME report demonstrating their compliance with FCC regulations. The proposed facility will provide expanded cell phone coverage for the area. Therefore, staff recommends that the County Board approve the subject use permit, subject to the proposed conditions, and with a County Board review in one (1) year (September 2013).

Proposed conditions:

1. The applicant, New Cingular Wireless d/b/a AT&T Mobility agrees that the telecommunications facility proposed on an application for a use permit dated June 19, 2012, consisting of a 50' telecommunications pole, twelve (12) antennas and a related equipment shelter (Telecommunications Facility), will be constructed as shown on the revised application package dated June 19, 2012 and approved by the County Board on September 15, 2012. The applicant agrees that any future installation of antennas or other equipment on this property shall be subject to review, and approval, by the Zoning Administrator. The applicant agrees that the pole shall not extend more than fifty (50) feet above grade, and the antennas shall be mounted at a radiation center (RAD) no greater than fifty (50) feet above grade and no portion of the antennas shall extend beyond 54 feet above grade.

2. The applicant agrees that the Telecommunications Facility shall be removed within ninety (90) days after it is no longer being used for wireless telecommunications purposes.
3. The applicant agrees that the proposed equipment shelter and related utility connection equipment shall match the exterior appearance and color of the existing WMATA transformer station as shown on the application package dated June 19, 2012 and approved by the County Board on September 15, 2012. The applicant further agrees that the shelter shall be of the size and location shown on the drawings in the revised application package.
4. The applicant agrees to provide landscaping on the site primarily within the areas surrounding the telecommunications pole and equipment shelter. The landscaping will consist of ten (10) Eastern Red Cedar trees (8'-10' tall, balled and burlapped) and eight (8) Eastern White Pine trees (8'-10' tall, balled and burlapped). Lawn area disturbed during construction shall be top-dressed and seeded. The applicant agrees to submit and obtain approval of a final landscape plan, as fulfilling this condition, from the County Manager or his designee prior to issuance of any permits for work on the site. The applicant agrees to install all landscaping prior to June 30, 2013 and maintain all landscaping called for in the approved landscape plan. The applicant agrees to maintain all landscaping at the base of the tower, and surrounding the site in good condition. Any modifications to the proposed landscape plan shall be subject to review, and approval, by the Zoning Administrator.
5. The applicant agrees that all utilities will be underground and all coax cables from the equipment cabinet will be hidden as much as possible within the telecommunications pole or any support structure. No external or exposed wiring is allowed on the telecommunications pole except for that required to connect to the antennas.
6. The applicant agrees that the telecommunications pole will be constructed to accommodate an additional wireless user. The applicant agrees that if additional equipment area is needed at the base of the shelter to accommodate an additional wireless user, the applicant will work to accommodate them to the greatest extent possible. Any future wireless use to be located on the proposed telecommunications pole shall be subject to review, and approval, by the Zoning Administrator as being consistent with this use permit approval.
7. The applicant agrees to identify a community liaison that shall be available to address any concerns regarding the facility operation. The name, telephone, and e-mail address of the liaison shall be provided to the Washington Metropolitan Area Transit Authority, the Arlington National Cemetery, the United States Department of the Interior, National Parks Service, the Commonwealth of Virginia Department of Historic Resources Office, and the Zoning Administrator prior to issuance of any permits for work on the Telecommunications facility.

PREVIOUS COUNTY BOARD ACTIONS:

May 19, 2012

Defer a use permit (U-3340-12-1) for a 60' tall, stealth telecommunications pole with accompanying equipment to the July 21, 2012 County Board meeting.

July 21, 2012

Defer a use permit (U-3340-12-1) for a 50' telecommunications pole with accompanying equipment shelter and a modification to setbacks for the telecommunications pole and equipment shelter to the September 15, 2012 County Board meeting.



June 6, 2012

Robert Brosnan, Director  
Arlington County, Virginia  
Office of Community Development  
2100 Clarendon Blvd., Suite 810  
Arlington, VA 22201

RE: Application for a Conditional Use Permit - AT&T Mobility ("AT&T")  
Washington Metropolitan Area Transit Authority ("WMATA") Traction  
Station-C06

Dear Bob:

AT&T is a wireless telecommunications provider licensed through the Federal Communication Commission ("FCC") and doing business in Arlington County. AT&T needs an additional telecommunications cellular base station at Map 18, Deed Book 3099, Page 1837 to fill a coverage gap as well as provide additional spectrum availability for its customers in this area of Arlington County. The site is currently improved with a WMATA Traction Station - C06 as well a Verizon Wireless ("VZW") (another wireless telecommunications provider), cellular base station which has been there since 2008. The site was chosen by AT&T as it is in the search area to locate an additional wireless base station to work in seamless cooperation with its existing network. AT&T radio frequency engineers identified this precise location to meet AT&T system reliability requirements for receiving and transmitting wireless telecommunications. This location offers the greatest potential for realizing maximum impact with fewer sites to promote higher quality usage and fill in the gap in coverage within the existing network. This site is in close proximity to the Pentagon, Arlington Cemetery and Metro Rail Station as well as Rte 110 and the George Washington Parkway. All experience heavy wireless demand.

The proposed AT&T site is situated on an existing power substation owned by the WMATA the rail system serving the Washington, DC area and suburbs. The property is zoned S-3A and a telecommunications facility is permitted there subject to a Conditional Use Permit approval. The power substation alongside the tracks of the Metro provides electrical service to this portion of the rail system. VZW has an existing unmanned base station at this site consisting of a 41' stealth flag pole and equipment shelter measuring 26' x 11' x 10'. AT&T cannot collocate on the VZW pole because AT&T's antenna would be too low due to the flag pole design.

AT&T has consulted with Arlington National Cemetery and with the National Park Service and received concurrence for AT&T's proposal. The National Park Service suggested that a 50' monopole, as opposed to a 60' flagpole, would be acceptable at this



location. AT&T would need a 60' stealth flagpole to obtain the same coverage as a 50' monopole. Arlington National Cemetery also agreed that a 50' monopole is acceptable. Due to the heavy tree cover and the distance from scenic view sheds a 50' monopole will not be noticeable except along Rte 110. The Commonwealth of Virginia Department of Historic Resources Office also reviewed and approved this site for the 50' monopole.

AT&T's accompanying equipment structure will be 11' x 20' x 10' at the base of the monopole and will have the same exterior appearance as the existing traction station and VZW equipment structure. This is an unmanned equipment structure that will have no customers or employees. A technician will visit the site periodically, approximately once a month, to ensure that it is in proper operating condition. Otherwise there will be no personal at the site. The site will not be lit and there is no noise, odors or other similar negative impacts. The equipment structure will be screened with additional landscaping as shown on Sheet LS1 of the accompanying Site Plan.

Should you have any questions regarding the above please feel free to contact the undersigned.

Respectfully Submitted,

Paul Whitley  
Network Building and Consulting  
[pwhitley@nbcllc.com](mailto:pwhitley@nbcllc.com)  
443-752-0338

FWS/kkp

cc: Ginger Beaudoin  
Cabot Goudy  
Frank Stearns



April 20, 2012

Arlington County Board  
c/o Zoning Section  
2100 Clarendon Boulevard  
Arlington, Virginia 22301

Re: Telecommunication Facility Installation  
Johnson Memorial  
1001 Jefferson Davis Highway, Arlington, Virginia  
WMATA Traction Power Substation/C006

To Whom It May Concern:

This letter is to inform the Arlington County Zoning Department that the Washington Metropolitan Area Transit Authority (WMATA) has been in discussions with New Cingular Wireless d/b/a AT&T Mobility (AT&T) and Network Building & Consulting, LLC (NB&C) about the following work on the above-referenced property:

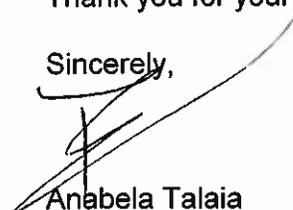
Installation of an unmanned telecommunication facility. The proposed facility will consist of constructing a 50' monopole to accommodate AT&T's antennas. All related equipment will be at the base of the tower inside a shelter.

The specific details of the project are currently under review by WMATA's Office of Joint Development and Adjacent Construction. Additionally, before WMATA can agree to the project, WMATA must obtain the approval of its Board of Directors and the Federal Transit Administration.

Notwithstanding the foregoing, AT&T has WMATA's permission to file for zoning for the proposed monopole at the subject site.

If you have any questions, please contact Ms. Heidi Ackerman at 202-962-2558. Thank you for your attention to this matter.

Sincerely,



Anabela Talaia  
Contracting Officer  
Office of Station Area Planning  
and Asset Management

**Washington  
Metropolitan Area  
Transit Authority**

600 Fifth Street, NW  
Washington, DC 20001  
202/962-1234

[www.metroopensdoors.com](http://www.metroopensdoors.com)

*A District of Columbia,  
Maryland and Virginia  
Transit Partnership*



# United States Department of the Interior

NATIONAL PARK SERVICE  
George Washington Memorial Parkway  
c/o Turkey Run Park  
McLean, Virginia 22101

IN REPLY REFER TO:  
L14 (GWMP)

April 12, 2012

Ms. Megan McDonald  
Staff Scientist  
ATC Associates  
9231 Rumsey Road  
Columbia, MD 21046  
VIA FAX: 410-381-8908, 2 pages

Re: Historical Inquiry, Johnson Memorial: telecommunications work at 1001 Jefferson Davis Highway, Arlington, Virginia 22202

Dear Ms. McDonald:

We are in receipt of your email of April 12, 2012, to George Washington Memorial Parkway (GWMP) Ranger Ben Helwig on the subject undertaking. As you know, our concerns are for potential viewshed impacts to historic properties under the administration of the National Park Service (NPS).

Two NPS park units: the George Washington Memorial Parkway (GWMP), a property listed on the National Register of Historic Places in part for its historic and scenic landscape values, and the Lyndon Baines Johnson Memorial Grove on the Potomac (LYBA), a presidential memorial listed on the National Register of Historic Places, fall within the identified area of potential effect.

Your email noted that the latest proposal at the site is to construct a 50-foot cell tower. As stated in June 2011, and December 2011, correspondence, we have long believed that a 50-foot tower at the site would avoid any viewshed impacts.

Thus, assuming no parts of the tower rise above 50 feet, we conclude that the proposed 50-foot tower for this subject undertaking will have no negative effects on locations within GWMP and LYBA. While we do not actively support cell tower installations near park sites, we have no objections to the proposed 50-foot tower.

We appreciate your and the applicants' efforts to work with over the past year in addressing our concerns. Preserving the views from these sites of national importance will allow for future generations to enjoy them in the same manner we do today.

Please feel free to contact Ben Helwig directly at 703-289-2515 if you have any other further questions on this project.

Sincerely,



Jon G. James  
Acting Superintendent

cc:

Mr. C. Andrew Lewis  
Washington, DC Historic Preservation Office  
1100 4th Street, SW, Suite E650  
Washington, DC 20024

Ms. Ethel Eaton  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221

Mr. Chris Novelli  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221

## Beaudoin, Ginger

---

**From:** Tim Smolinski [tsmolinski2@nbcllc.com]  
**Sent:** Monday, April 16, 2012 10:10 AM  
**To:** Beaudoin, Ginger  
**Cc:** Tim Smolinski  
**Subject:** FW: AT&T's Proposed Monopole on Route 110 / AT&T's Johnson Memorial Site

FYI from Arlington Cemetery.

TIM SMOLINSKI  
Site Acquisition Consultant

NETWORK BUILDING & CONSULTING, LLC  
7380 Coca Cola Drive, Suite 106, Hanover, MD 21076 M 703.255.0177 | networkbuilding.com  
Over 25 years experience

-----Original Message-----

**From:** Miller, Nicholas R MAJ MIL USA ANC/POG OSA [<mailto:nicholas.r.miller@us.army.mil>]  
**Sent:** Saturday, August 06, 2011 1:39 PM  
**To:** Tim Smolinski  
**Cc:** Lautar, Mike (SCE)  
**Subject:** RE: AT&T's Proposed Monopole on Route 110 / AT&T's Johnson Memorial Site

 Mr. Tim Smolinski,

We appreciate you providing the documents outlining the proposed placement of an AT&T monopole along RT110 and affording Arlington National Cemetery an opportunity to review the proposal and provide a comment.

At this time, ANC does not have any comments or feedback related to your proposal as it is not on ANC property. Please let me know if there are future issues you believe may impact ANC.

Very Respectfully,  
Nick

Nicholas R. Miller  
Major, US Army  
Chief Information Officer / G-6  
Army National Cemeteries Program  
Arlington National Cemetery  
Office: 703-614-0029  
Office Cell: 571-218-6042  
Personal Cell: 610-348-6955

Tell us how we're doing!!

[http://ice.disa.mil/index.cfm?fa=card&sp=122269&s=1009&dep=\\*DoD&sc=34](http://ice.disa.mil/index.cfm?fa=card&sp=122269&s=1009&dep=*DoD&sc=34)

If you need access to the Interment Scheduler System (ISS) please email Sunny Shin at [taes.shin@us.army.mil](mailto:taes.shin@us.army.mil) or call 703-614-0037.

-----Original Message-----

**From:** Tim Smolinski [<mailto:t.smolinski@verizon.net>]  
**Sent:** Wednesday, August 03, 2011 9:27 AM  
**To:** Miller, Nicholas R MAJ MIL USA ANC/POG OSA

Cc: 'Lautar, Mike (SCE)'

Subject: AT&T's Proposed Monopole on Route 110 / AT&T's Johnson Memorial Site

Major Miller,

Thank you for taking my call yesterday regarding AT&T's proposed monopole at WMATA's Traction Substation located off Route 110 in Arlington. Please see AT&T's plans for this installation for your review and comment.

I have requested a coverage map from AT&T that will show the improved coverage in the area. I will provide this to you as soon as I receive it.

Thank you.

TIM SMOLINSKI  
Site Acquisition Consultant

NETWORK BUILDING & CONSULTING, LLC  
7380 Coca Cola Drive, Suite 106, Hanover, MD 21076  
M 703.255.0177 | [networkbuilding.com](http://networkbuilding.com)  
Over 25 years experience



DEPARTMENT OF COMMUNITY PLANNING, HOUSING AND DEVELOPMENT

Zoning Administration

#1 Courthouse Plaza, 2100 Clarendon Boulevard, Suite 1000 Arlington, VA 22201  
TEL 703.228.3883 FAX 703.228.3896 www.arlingtonva.us

November 23, 2011

Paul Whitley  
The New Cingular Wireless d/b/a AT&T Mobility  
7380 Coca Cola Drive, Suite 106  
Hanover, MD 21076

Re: **1001 Jefferson Davis Highway | RPC# 34-036-001**  
**'Parcel 3' referenced at Deed Book 3099 Page 1837 in the Land Records of**  
**Arlington County, Virginia ("Subject Property")**

Dear Mr. Whitley:

The following information is provided in response to the request we received for information on the current zoning status of the above-referenced property listed as RPC# 34-036-001.

The Subject Property is zoned "S-3A" Special District. The uses provided for are described in §3 of the Arlington County Zoning Ordinance (enclosed). Specific to your inquiry, telecommunications facilities are regarded as a conditional use, requiring approval of a use permit.

In reviewing the documents provided with your request, it appears that the Subject Property is not federal property. The owner of record is the Washington Metropolitan Area Transit Authority (WMATA) which is an interstate agency governed by the Washington Metropolitan Area Transit Authority Compact.

According to §75 of this Compact:

*"75. Compliance with Laws, Regulations and Ordinances*

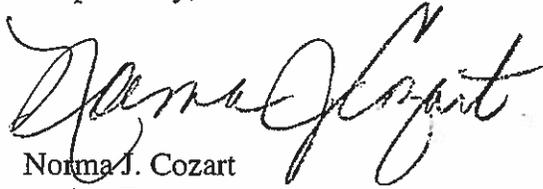
*The Board shall comply with all laws, ordinances and regulations of the signatories and political subdivisions and agencies thereof with respect to use of streets, highways, and all other vehicular facilities, traffic control and regulation, zoning, signs and buildings."*

As such, the Subject Property is subject to the Arlington County Zoning Ordinance.

I trust this letter adequately addresses your request for information regarding the above-referenced property. Please understand the information provided above is valid as of the date of this letter and is subject to change by legislative act of the Arlington County

Board. If there are any questions or a need for further clarification please feel free to contact me at 703-228-3883.

Respectfully,

A handwritten signature in black ink, appearing to read "Norma J. Cozart". The signature is fluid and cursive, with the first name being the most prominent.

Norma J. Cozart  
Acting Zoning Administrator

cc: - ZOC-1237  
- Address Files  
- 2011 Compliance Folder

Recorded 11/21 '2000

Book 3099  
Page 1837

After recording, please return to:  
Professionals Title & Escrow Co.  
15245 Shady Grove Road, #330  
Rockville, MD 20850 PT&E: 1-12222-00  
Title Insurer: N/A  
Parcel I.D. #: 34036001

VC118  
C006a

**QUITCLAIM DEED**

**THIS DEED OF CONVEYANCE**, made this 9th day of May, 2000, by and between the **UNITED STATES OF AMERICA**, by and through the **SECRETARY OF THE INTERIOR**, hereinafter referred to as the "**GRANTOR**", acting by and through the Regional Director, National Capital Region, National Park Service, U. S. Department of the Interior, pursuant to Section 5(b) of Public Law 90-401 approved July 15, 1968, as amended, codified at 16 U.S.C. 4601-22(b), and the **WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**, a body corporate and politic (an agency and instrumentality of the District of Columbia, the State of Maryland and the Commonwealth of Virginia, created February 20, 1967, pursuant to Section 1, Paragraph 4, of Public Law 89-774, approved November 6, 1966), to further the objectives of Title III of the **WASHINGTON METROPOLITAN AREA TRANSIT REGULATION COMPACT**, Public Law 89-774 (80 Stat. 1324), hereinafter referred to as the "**GRANTEE**".

**WITNESSETH THAT THE GRANTOR**, in consideration of the sum of **THREE HUNDRED EIGHTY-ONE THOUSAND NINE HUNDRED FIFTY DOLLARS (\$381,950.00)**, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby grant and convey by quit-claim deed, without any warranty of title, a fee simple interest unto the **GRANTEE**, its successors and assigns, in the following described land:

All that tract or parcel of land situate in Arlington County, Virginia, being part of U.S. Reservation 404V as shown on Plat Showing Fee Simple Parcel and Easement on the Property of National Park Service, Arlington County, Virginia, attached hereto and made a part hereof, and being more particularly bounded and described as follows:

**PARCEL 1:**

Beginning at the intersection of the western right-of-way line of Washington Blvd. with the northern line of the Commonwealth of Virginia (formerly Rosslyn Connecting Railroad Co.) said point having Virginia State Plane Coordinates, North Zone, of N 444,133.75, E 2,410,619.85; thence in the WMATA Meridian and with said Commonwealth line N 36°58'56" W, 324.85 feet, to the point of beginning; thence continuing along said line N 36°58'57"W, 150.03 feet; thence leaving said line and through the land of the National Park Service N 51°49'30" E, 43.43 feet; thence N 38°10'30"W, 384.42 feet; thence S 51°49'30" W, 35.43 feet; to a point on said Commonwealth line; thence along said line along the arc of a curve to the right the radius of which is 1136.28 feet, an arc distance of 40.033 feet; thence leaving said line N 51°49'31" E, 33.93 feet; thence N 38°10'30"W, 30.57 feet; thence

RPC# 34036001

GRANTOR'S address: 1100 UNIO DRIVE, NW, WASHINGTON, DC 20242  
GRANTEE'S address: 600 Fifteenth Street, NW, Washington, DC 20001

N 51° 49'30" E, 17.000 feet; thence N 38°10'30" W, 200.28 feet; to a point on said Commonwealth line; thence along said line N 22°32'58" W, 148.50 feet; thence leaving said line S 38°10'30" E, 458.30 feet; thence S 51°51'32" W, 1.000 feet; thence S 38°10'29" E, 675.000 feet; to Point "A"; thence S 51°49'33" W, 38.000 feet; thence N 38°10'25" W, 185.000 feet; thence S 51°49'30" W, 64.55 feet to the point of beginning, containing 60,040 square feet.

**PARCEL 2:**

Beginning at a point which is the intersection of the western right-of-way line of Washington Blvd. with the northern line of the property of the Commonwealth of Virginia (formerly Rosslyn Connecting Railway Company D.B. 1495, Pg. 149), N 36°58' 56" W, 324.85 feet; thence N 36°58'57" W, 150.03 feet to the point of beginning; from the point of beginning thence the following courses and distances: N 36°58'58"W, 384.51 feet; thence N 51°49'30"E, 35.43 feet; thence S 38°10'30"E, 384.43 feet; thence S 51°49'28"W, 43.43 feet to the point of beginning, containing 15,159 square feet.

**PARCEL 3:**

Beginning at a point which is the intersection of the western right-of-way line of Washington Blvd. with the northern line of property of the Commonwealth of Virginia (formerly Rosslyn Connecting Railway Company D.B. 1495, pg. 149); thence running the following courses and distances: N 36°58'56"W, 324.85 feet; thence N 51°49'30"E, 64.55 feet; thence S 38°10'25"E, 185.00 feet, N38°10'31"W, 58.09 feet; thence along the arc of a curve to the right, the radius of which is 4015.00 feet, an arc distance of 108.44 feet, said curve having a chord bearing of S 02°56'44"W and a chord distance of 108.435 feet to the point of beginning, containing 19,177 square feet.

**PARCEL 4:**

Beginning at a point which is the intersection of the western right-of-way line of Washington Blvd. with the northern line of the property of the Commonwealth of Virginia (formerly Rosslyn Connecting Railway Company D.B. 1495, pg 149); thence N36°58'56"W, 324.85 feet, N36°58'57"W, 150.03 feet, N36°58'58"W, 384.51 feet, curve 3, R=1136.28, L=40.033, to the point of beginning; from the point of beginning thence the following courses and distances: along the arc of curve to the right, the radius of which is 1,136.28 feet, an arc distance of 85.547 feet, said curve having a chord bearing of N 32°53'08"W and a chord distance of 85.543 feet; thence N 19°38'20"W, 43.27 feet; thence N 22°32'58"W, 108.43 feet; thence S 38°10'30"E, 200.28 feet; thence S 51°49'30"W, 17.00 feet; thence S 38°10'30"E, 30.57 feet; thence S 51°49'30"W, 33.94 feet to the point of beginning, containing 6,543 square feet.

IN TESTIMONY WHEREOF, the United States of America by and through the Secretary of the Interior, the Grantor, has executed or caused this Quitclaim Deed to be executed on its behalf as of the date first herein above written as its free act and deed for the uses and purposes herein contained, and intending to be legally bound, has of this day and year first above written, caused these presents to be executed by Terry R. Carlstrom, Regional Director, National Capital Region, National Park Service, U.S. Department of the Interior, as its true and lawful attorney-in-fact to acknowledge and deliver this Quitclaim Deed as its free act and deed for the uses and purposes herein contained.

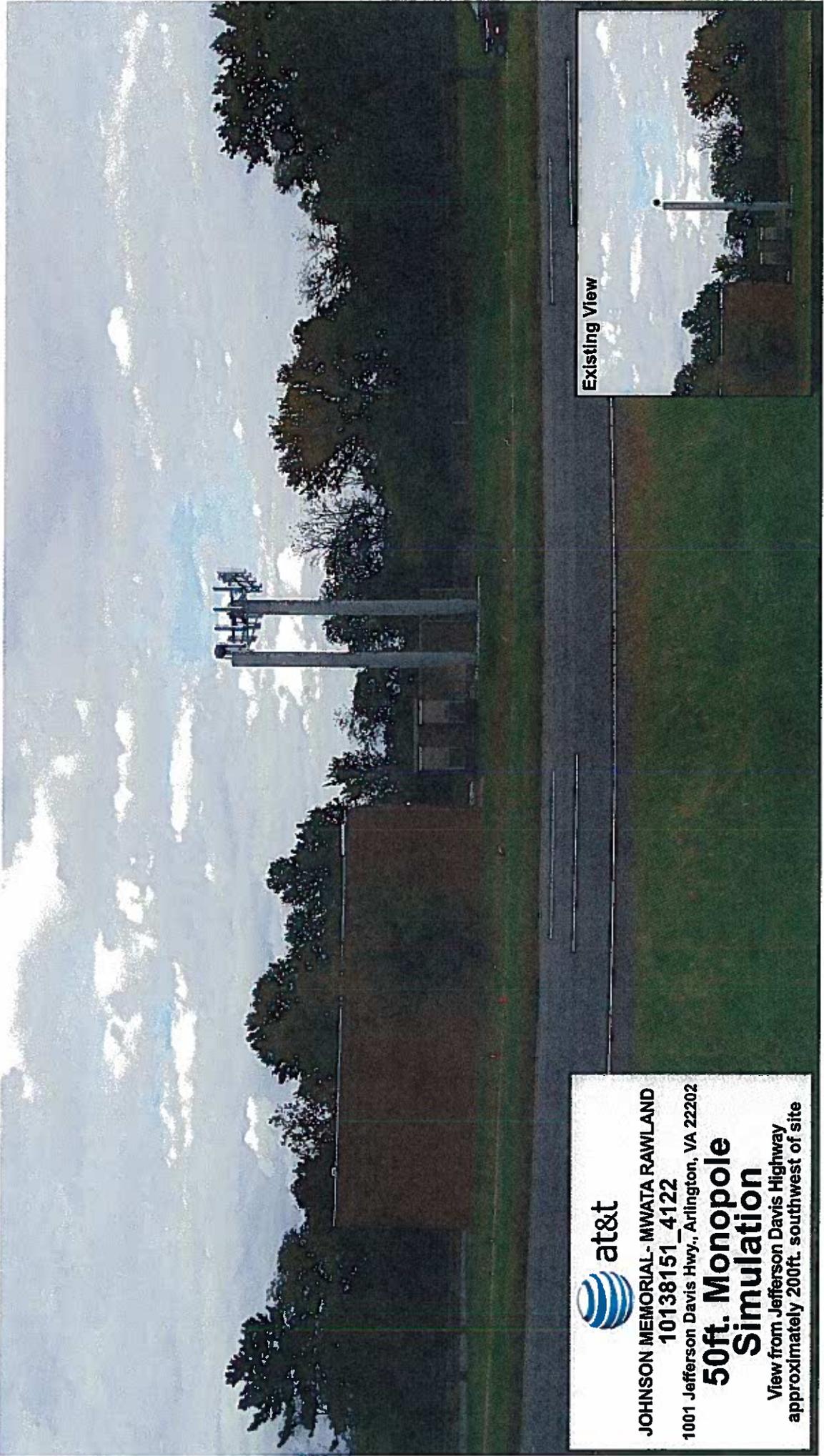
WITNESS:  
[Signature]

GRANTOR:  
By: [Signature]  
Terry R. Carlstrom  
Regional Director  
National Capital Region  
National Park Service  
U.S. Department of the Interior

United States of America ) ss:

I, Julia D. Young, a Notary Public in and for the District of Columbia whose commission as such expires on the 31<sup>st</sup> day of May, 2004, do hereby certify that Terry R. Carlstrom, a party to a Deed bearing date on the 9<sup>th</sup> day of May, 2000, and hereto annexed, personally appeared before me in said District, the Regional Director, National Capital Region being personally well known to me as (or proved by the oath of credible witness to be) the person who executed the said Deed, and acknowledged the same to be his act and deed.

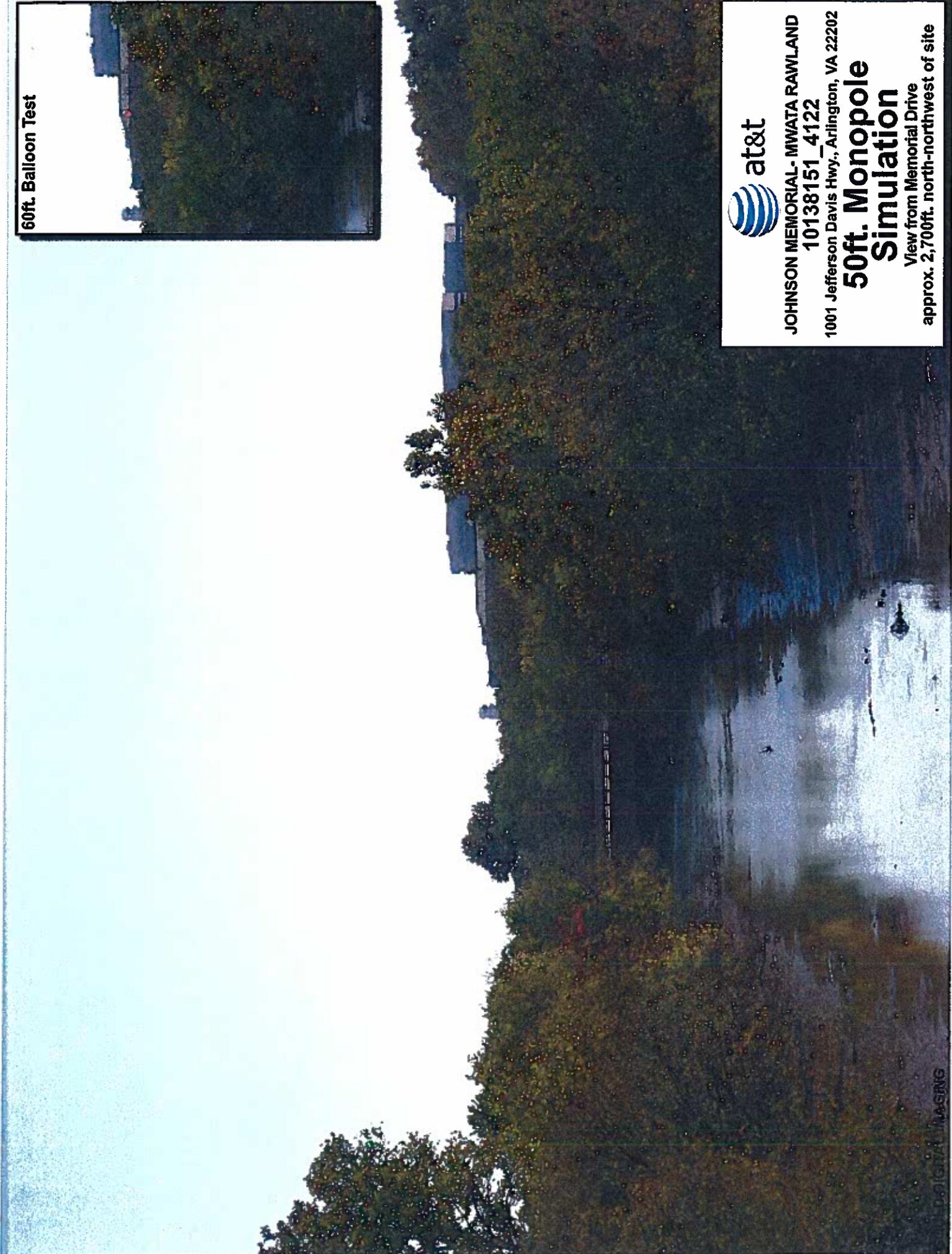
**Julia D. Young**  
Notary Public  
District of Columbia  
Commission Expires May 31, 2004



Existing View

  
**JOHNSON MEMORIAL - MWATA RAWLAND**  
**10138151\_4122**  
1001 Jefferson Davis Hwy., Arlington, VA 22202  
**50ft. Monopole**  
**Simulation**  
View from Jefferson Davis Highway  
approximately 200ft. southwest of site

60ft. Balloon Test



JOHNSON MEMORIAL- MWATA RAWLAND  
10138151\_4122

1001 Jefferson Davis Hwy., Arlington, VA 22202

# 50ft. Monopole Simulation

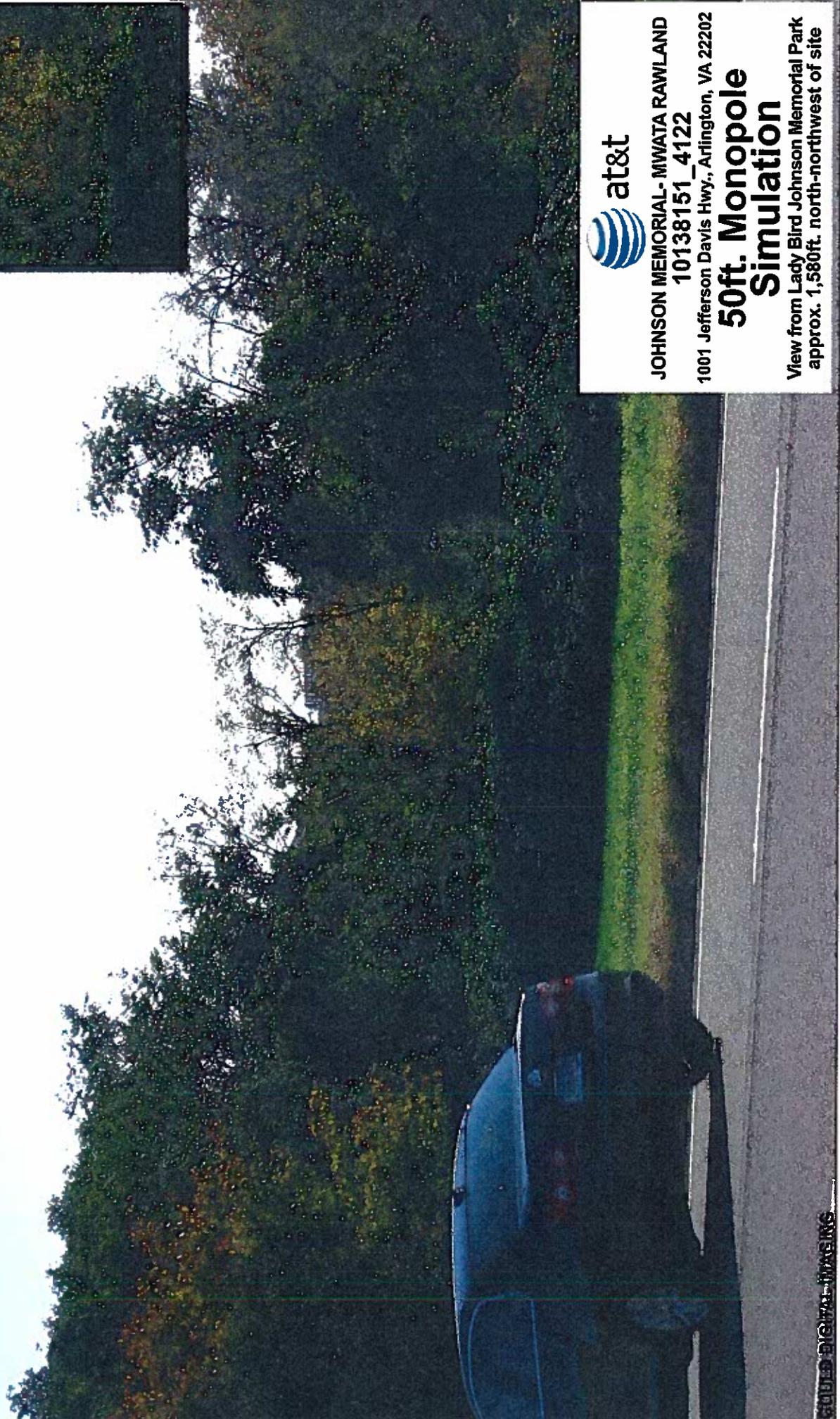
View from Memorial Drive  
approx. 2,700ft. north-northwest of site

60ft. Balloon Test




  
**JOHNSON MEMORIAL- MWATA RAWLAND**  
**10138151\_4122**  
 1001 Jefferson Davis Hwy., Arlington, VA 22202  
**50ft. Monopole**  
**Not Visible**  
 View from Lady Bird Johnson Memorial Park  
 approx. 2,100ft. north-northwest of site

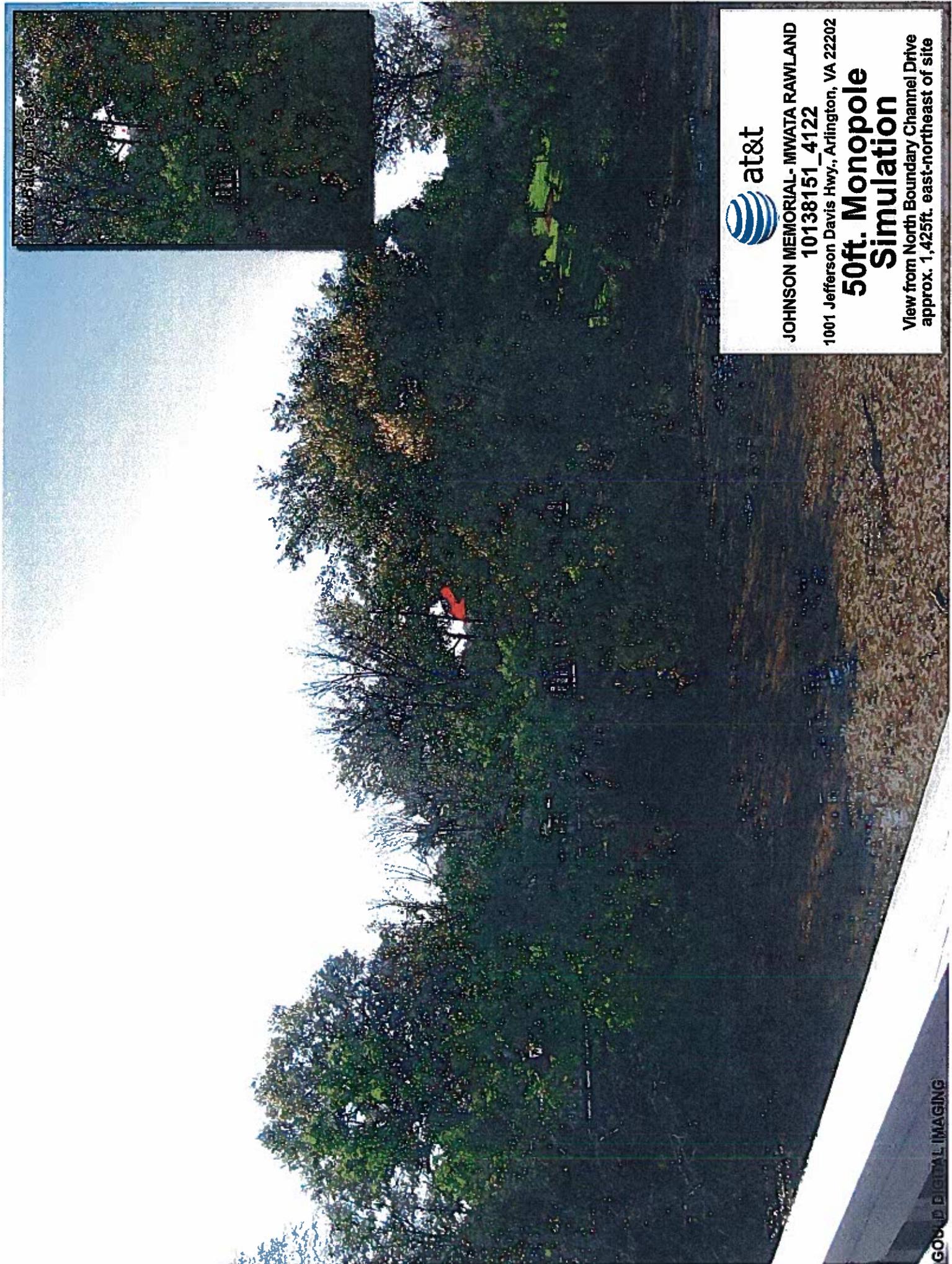
60ft. Balloon Test



JOHNSON MEMORIAL - MWATA RAWLAND  
10138151\_4122  
1001 Jefferson Davis Hwy., Arlington, VA 22202

### 50ft. Monopole Simulation

View from Lady Bird Johnson Memorial Park  
approx. 1,580ft. north-northwest of site



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JOHNSON MEMORIAL- MWATA RAWLAND  
10138151\_4122  
1001 Jefferson Davis Hwy., Arlington, VA 22202

# 50ft. Monopole Simulation

View from North Boundary Channel Drive  
approx. 1,425ft. east-northeast of site



50ft. Balloon Test



JOHNSON MEMORIAL - MWATA RAWLAND  
10138151\_4122

1001 Jefferson Davis Hwy., Arlington, VA 22202

# 50ft. Monopole Simulation

View from Lady Bird Johnson Memorial Park  
approx. 2,120ft. east-southeast of site

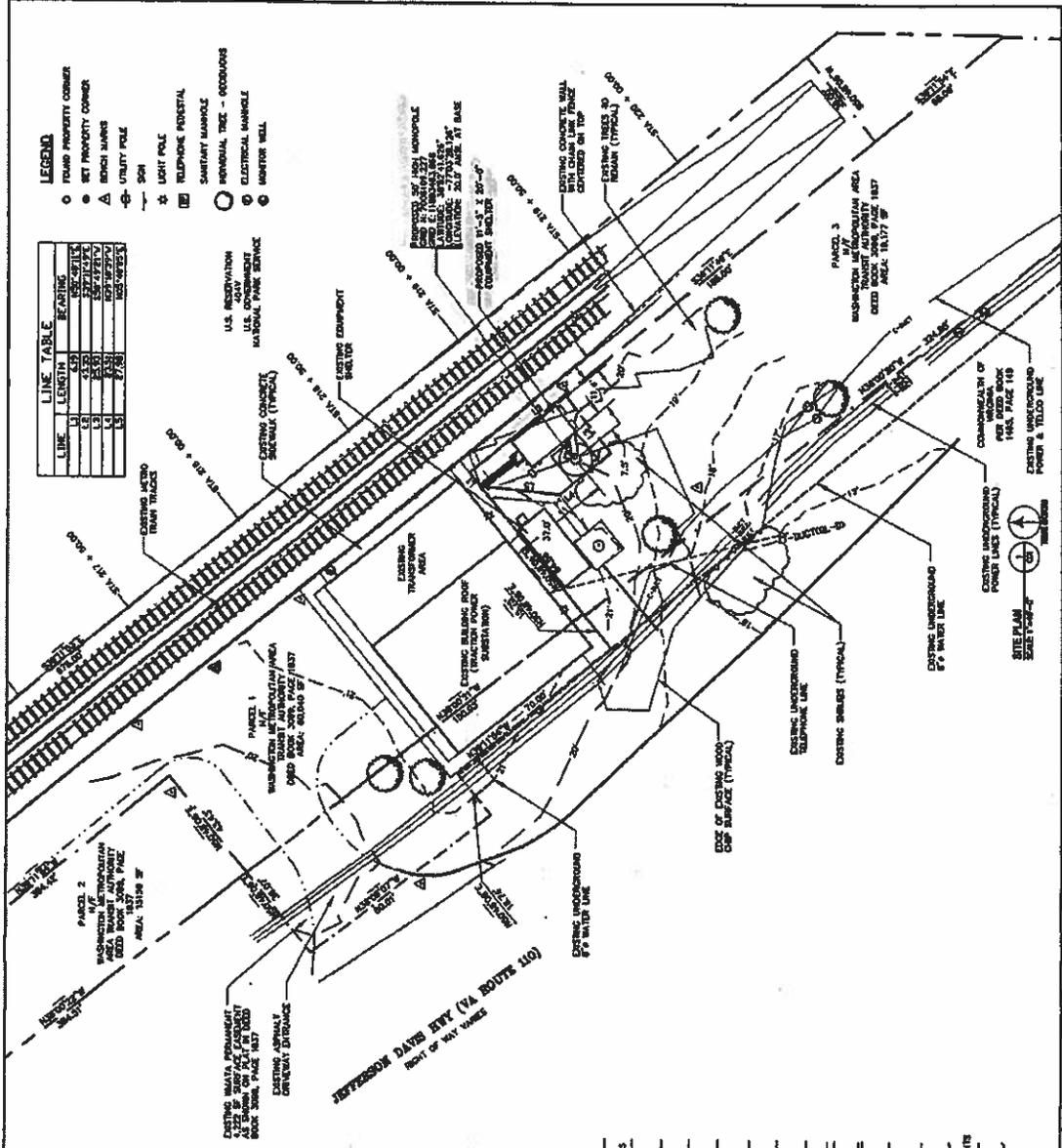




VICINITY MAP  
SCALE: 1"=200'-0"  
TRUE NORTH

**SITE PLAN NOTES**

- 1) THE NAME, JOHNSON MEMORIAL - WYATA RAW LAND SITE NUMBER: 10132161-4122
- 2) THIS IS NOT A BOUNDARY SURVEY AND IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.
- 3) THE PARCEL INFORMATION: JOHNSON MEMORIAL - WYATA RAW LAND TRACT, WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY CEDD TRACT, PLAT 187, AREA 15108.07 AC. PARCELS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. USE: TRACTION POWER SUBSTATION CDS FOLLOWING. PARCEL NUMBER: 10132161-4122. AREA: 15108.07 AC. FOLIO 1487
- 4) THE RECORDED REFERENCES FOR THE SUBJECT PARCEL ARE AS FOLLOWS: PLAT 187, 2007 FOLIO 1487
- 5) THE BOUNDARY LINE HAS 80 AND 100' BEING BASE TO STATE GRID.
- 6) NO UNRECORDED UTILITIES HAVE BEEN LOCATED. THE PRESENCE OF ANY SUCH UTILITIES MUST BE CONFIRMED BY THE CONTRACTOR BEFORE CONSTRUCTION.
- 7) NO WETLANDS HAVE BEEN IDENTIFIED AND ANY AREAS SHOWN AS WETLANDS ARE BASED ON VISUAL INSPECTION AND SURFACE FEATURES AND DO NOT CONSTITUTE A BOUNDARY WETLAND.
- 8) THE FLOOD ZONE OF THE PROPOSED WETLAND IS AS FOLLOWS: FLOOD ZONE 10. AREA OF IMPROVED FLOODING SOURCE: PEAK FLOODING SOURCE: 100' WIDE. PARCEL NUMBER: 10132161-4122. RETIRED: MAY 3, 1982.
- 9) NO TITLE REPORT WAS FURNISHED FOR THIS SURVEY.
- 10) THE DATA COLLECTED AND SHOWN ON THIS DRAWING ARE FOR THE PURPOSES OF CONSTRUCTION OF A CELLULAR TELEPHONE ANTENNA. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES AND ALL APPROPRIATE EASEMENTS.
- 11) NO UNRECORDED EASEMENTS ARE SHOWN ON THIS SURVEY AND IT IS POSSIBLE THAT SUCH EASEMENTS IMPACT THE SITE.
- 12) THE LOCATION OF THE PROPOSED WETLAND IS AS FOLLOWS: THE WETLAND IS LISTED BELOW ARE WITHIN 500' HORIZONTAL AND 50' VERTICAL. N 34° 37' 41.82" W 148.77' BY 28.27' ELEVATION: 20.07' ABL, AT BASE.



**LINE TABLE**

LINE	LENGTH	BEARING
1	15.50	S 87° 14' 14.14" W
2	15.50	S 87° 14' 14.14" W
3	15.50	S 87° 14' 14.14" W
4	15.50	S 87° 14' 14.14" W
5	15.50	S 87° 14' 14.14" W
6	15.50	S 87° 14' 14.14" W
7	15.50	S 87° 14' 14.14" W
8	15.50	S 87° 14' 14.14" W
9	15.50	S 87° 14' 14.14" W
10	15.50	S 87° 14' 14.14" W

- LEGEND**
- TEMPORARY CORNER
  - SET PROPERTY CORNER
  - △ BENCH MARK
  - ⊕ UTILITY POLE
  - ⊙ SIGN
  - ⊙ TELEPHONE PESTRAL
  - ⊙ LIGHT POLE
  - ⊙ TELEPHONE PESTRAL
  - ⊙ SANITARY MANHOLE
  - ⊙ SEWER MANHOLE
  - ⊙ ELECTRICAL MANHOLE
  - ⊙ WATER WELL
  - ⊙ U.S. RESERVATION
  - ⊙ U.S. NATIONAL PARK SERVICE
  - ⊙ NATIONAL PARK SERVICE

**JOHNSON MEMORIAL - WYATA RAW LAND**  
10132161-4122  
JEFFERSON DAVIS HWY @ WASHINGTON BLVD  
ARLINGTON, VA 22202

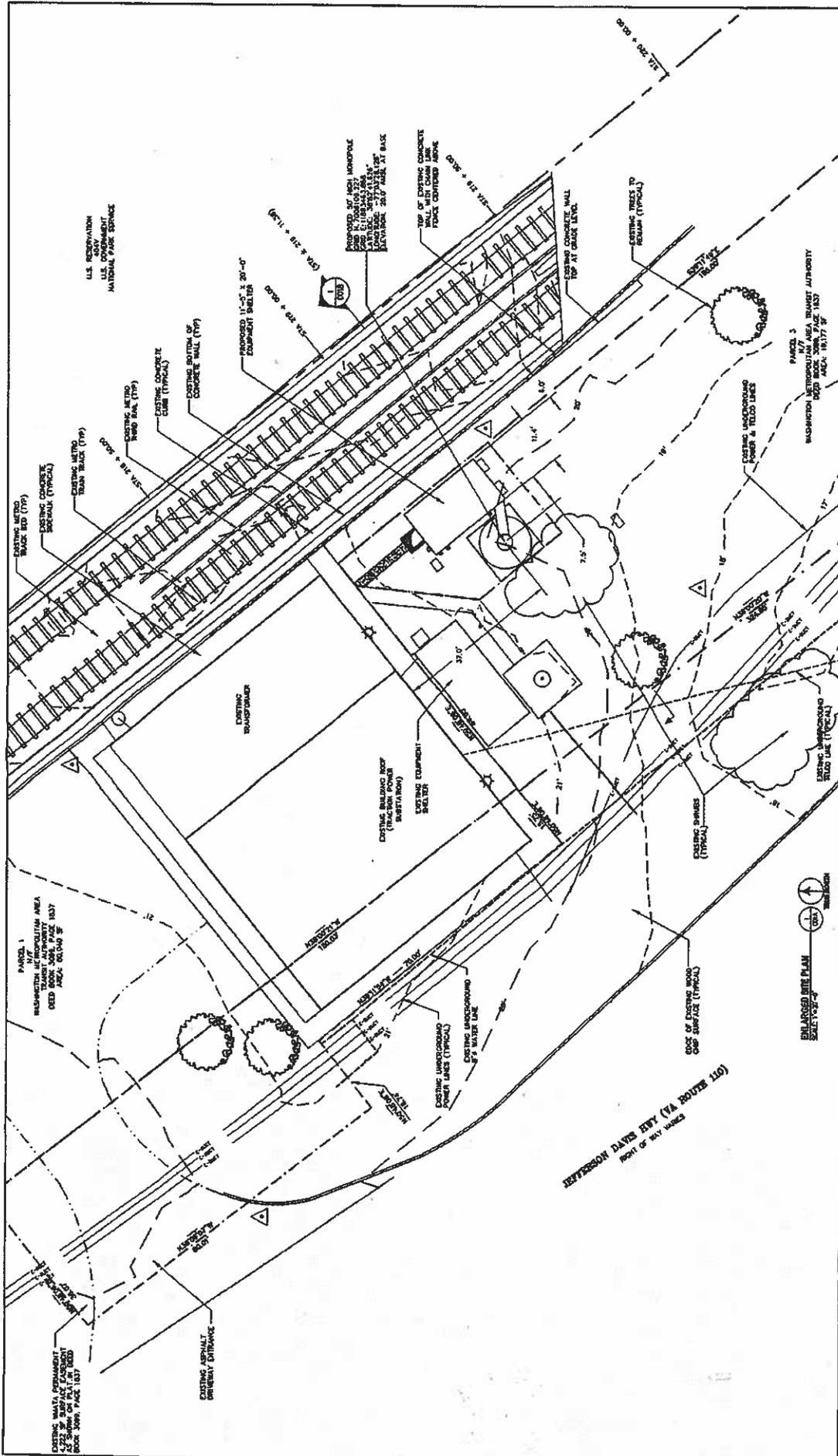
**entrex**  
COMMUNICATIONS DIVISION, 1800 WEST  
BROADWAY, SUITE 1000, DENVER, CO 80202  
PHONE: 303.733.8800  
FAX: 303.733.8801

**at&t**  
1134.006  
1134.006  
10132161-4122  
ARLINGTON, VA 22202

**SITE PLAN**  
JOB NO. 10132161-4122  
DATE: 01/01/01

1	10/20/01	DESIGNED	CS	CS	CS
2	05/21/01	CONSTRUCTION	MA	MA	MA
3	05/21/01	CONSTRUCTION	RE	RE	RE
4	05/21/01	CONSTRUCTION	RE	RE	RE
5	05/21/01	CONSTRUCTION	RE	RE	RE
6	05/21/01	CONSTRUCTION	RE	RE	RE
7	05/21/01	CONSTRUCTION	RE	RE	RE
8	05/21/01	CONSTRUCTION	RE	RE	RE
9	05/21/01	CONSTRUCTION	RE	RE	RE
10	05/21/01	CONSTRUCTION	RE	RE	RE

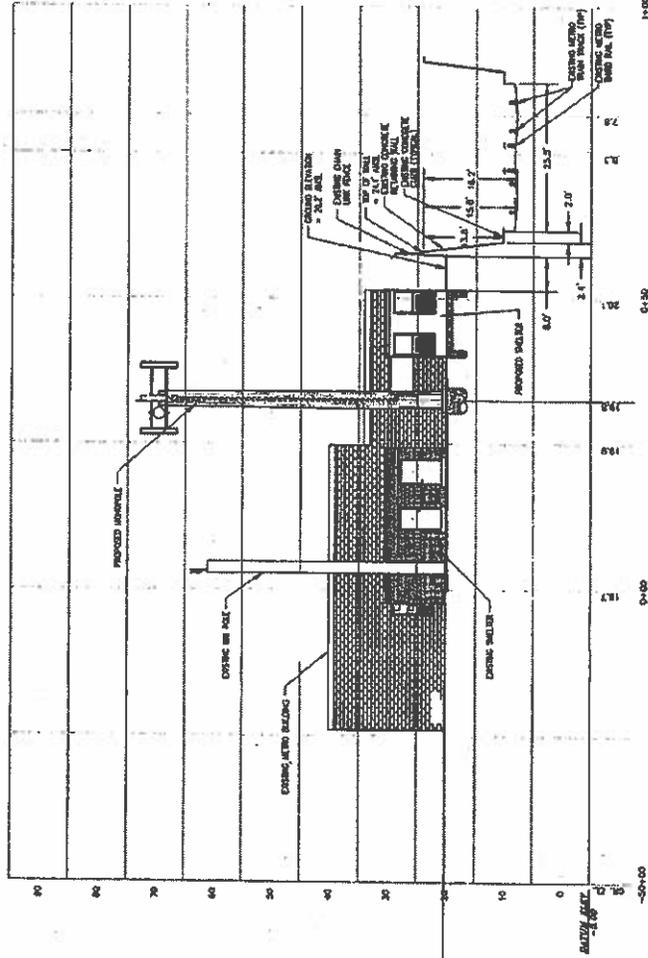
RESULTS AS SHOWN, C.E. (ESIGNED)



<p>entrex COMMUNICATIONS SERVICES, Inc. 1000 WASHINGTON BLVD BETHESDA, MD 20814 PHONE: (301) 440-0000 FAX: (301) 440-0001</p>		<p>PROJECT NUMBER: 1134.004</p>	<p>JOHNSON MEMORIAL - WYATA RAW LAND 10128161_4122 JOTEGSON DAVIS HWY &amp; WASHINGTON BLVD ARLINGTON, VA 22202</p>	<p>at&amp;t 7150 SHANNON DRIVE MANASSAS, VA 20108</p>	<table border="1"> <tr> <td>1</td> <td>3/20/73</td> <td>REVISED VERTICALLY PERMIT</td> <td>U.S. G.S. CO.</td> </tr> <tr> <td>2</td> <td>3/27/73</td> <td>CONSTRUCTION</td> <td>U.S. G.S. CO.</td> </tr> <tr> <td>3</td> <td>3/27/73</td> <td>CONSTRUCTION REVIEW</td> <td>U.S. G.S. CO.</td> </tr> <tr> <td>4</td> <td>3/27/73</td> <td>REVISIONS</td> <td>U.S. G.S. CO.</td> </tr> </table> <p>SCALE: AS SHOWN C.D. DESIGNED</p>	1	3/20/73	REVISED VERTICALLY PERMIT	U.S. G.S. CO.	2	3/27/73	CONSTRUCTION	U.S. G.S. CO.	3	3/27/73	CONSTRUCTION REVIEW	U.S. G.S. CO.	4	3/27/73	REVISIONS	U.S. G.S. CO.	<p>ENLARGED SITE PLAN SCALE: 1/8" = 1'-0"</p>	<p>ENLARGED SITE PLAN</p>	<p>JOB NO.: 2172-432</p> <p>DESIGNED: WILBERT</p> <p>DATE: 03/14/73</p>
1	3/20/73	REVISED VERTICALLY PERMIT	U.S. G.S. CO.																					
2	3/27/73	CONSTRUCTION	U.S. G.S. CO.																					
3	3/27/73	CONSTRUCTION REVIEW	U.S. G.S. CO.																					
4	3/27/73	REVISIONS	U.S. G.S. CO.																					



VICINITY MAP  
SCALE 1" = 2000'-0"  
TRUE NORTH



NOTE:  
SHOWN PROFILE IS APPROXIMATELY AT  
STATION 0+00

TRACK BED PROFILE  
SCALE 1" = 10'-0"



JOHNSON MEMORIAL - WYAYA RAW LAND  
10189161\_4122  
JETUSON DMC INT @ WASHINGTON BLVD  
ALBUQUERQUE, NM 87202

PROJECT NUMBER  
1154.006

**entrex**  
COMMUNICATIONS CORPORATION, INC.  
10000 W. CENTRAL AVENUE, SUITE 200  
DENVER, COLORADO 80202  
PHONE: (303) 440-0000  
FAX: (303) 440-0001



NO.	DATE	BY	FOR
1	06/06/12	R.S. C.S. C.C.	REVISED VERTICAL FILE IDENT
2	05/21/12	R.S. C.S. C.C.	CONSTRUCTION
3	04/19/12	R.S. C.S. C.C.	CONSTRUCTION REVIEW
4	04/19/12	R.S. C.S. C.C.	REVISIONS
5	04/19/12	R.S. C.S. C.C.	BY ENGINEER

DATE

DESIGNED

CHECKED

APPROVED

DATE

BY

JOB NO.

24782-432

PROJECT NUMBER

1154.006

PROJECT NAME

JOHNSON MEMORIAL - WYAYA RAW LAND

10189161\_4122

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ALBUQUERQUE, NM 87202

DATE

BY

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CONSTRUCTION REVIEW

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ALBUQUERQUE, NM 87202

DATE





CABLE SCHEDULE AND RF SYSTEM DESIGN PLAN (RF YELLOW SHEET VERSION 3.0 DATED 11/18/11)

SECTOR	ANTENNA POSITION	MAKE	MODEL	RAD CR. FT. AGL	AZIMUTH	COAX SIZE IN.	APPROX. LENGTH	COAX LOCATION	HANDLINE COLOR CODE	SYSTEM TYPE	ANTENNA PORT #	TAG / ATT #
1	#1	POWERWAVE	P45-16-XUH-RR	50.0'	340'	COMMSCOPE FXL 1823 1.5/8"	90±	1	BROWN / BLUE	180A-15	11	ATT 11
								2	BROWN / BROWN	180B-15	12	ATT 12
								3	BROWN / GREY	180C-15	13	ATT 13
								4	BROWN / ORANGE	180D-15	14	ATT 14
								5	N/A	180E-15	15	ATT 15
								6	N/A	180F-15	16	ATT 16
2	#2	POWERWAVE	P45-16-XUH-RR	50.0'	340'	COMMSCOPE FXL 1823 1.5/8"	90±	7	BROWN / RED	180A-15	17	ATT 17
								8	BROWN / YELLOW	180B-15	18	ATT 18
								9	ORANGE / BLUE	180C-15	19	ATT 19
								10	ORANGE / BROWN	180D-15	20	ATT 20
								11	ORANGE / GREY	180E-15	21	ATT 21
								12	ORANGE / ORANGE	180F-15	22	ATT 22
3	#3	POWERWAVE	P45-16-XUH-RR	50.0'	220'	COMMSCOPE FXL 1823 1.5/8"	90±	13	N/A	180A-15	23	ATT 23
								14	N/A	180B-15	24	ATT 24
								15	ORANGE / RED	180C-15	25	ATT 25
								16	ORANGE / YELLOW	180D-15	26	ATT 26
								17	GREEN / BLUE	180E-15	27	ATT 27
								18	GREEN / BROWN	180F-15	28	ATT 28
3	#4	POWERWAVE	P45-16-XUH-RR	50.0'	220'	COMMSCOPE FXL 1823 1.5/8"	90±	19	GREEN / GREY	180A-15	29	ATT 29
								20	GREEN / ORANGE	180B-15	30	ATT 30
								21	N/A	180C-15	31	ATT 31
								22	N/A	180D-15	32	ATT 32
								23	GREEN / RED	180E-15	33	ATT 33
								24	GREEN / YELLOW	180F-15	34	ATT 34

(1) CPS MOUNTED ON ANTENNA PIPE MOUNT  
 # OF ANTENNAS PER SECTOR: 3  
 (2) TOWER MOUNTED ALUMINUM POWERWAVE TTS-080311-001 (1 PER SECTOR), (3) ALL AND RBH (1 PER SECTOR), (4) ALL AND RBH (1 PER SECTOR)  
 (5) ALL AND RBH (1 PER SECTOR), (6) ALL AND RBH (1 PER SECTOR)  
 NEW EQUIPMENT: JES EQUIPMENT SHEET SIZE: 11-5-20-0

NOTE:  
 1. SUBCONTRACTOR SHALL COORDINATE COLOR CODING WITH THE MASTER COLOR CODE DOCUMENT.  
 2. INSTALL SLEEVE ARRESTORS ON ANY WIRE CABLES CROSSING TO NEAREST GROUND BAR.  
 3. SUG CONDUCTOR SHALL INSTALL A BRASS IDENTIFICATION TAG (1/2" IN DIAMETER WITH 1/4" STAMPED LETTERS AND NUMBERS ONE AT THE ANTENNA PORT CONNECTION NEAR THE END OF THE JUMPER AND ONE ON EACH END OF THE JUMPER SPRING THE RADIO EQUIPMENT. EACH TAG WILL BE STAMPED WITH "ATT AND THE ANTENNA PORT IDENTIFICATION NUMBER".  
 TAGS SHALL BE ATTACHED WITH CORROSION PROOF BY RESIN/ITAC TAG OR CABLE-TIE.

SCALE: AS SHOWN  
 REVISIONS: C.C. DRAWING: W.A.  
 NO. DATE BY CHK APPR  
 1 12/08/12 REVISOR: W.A. C.C. S.E.  
 2 01/27/12 CONSTRUCTION: W.A. C.C. S.E.  
 3 01/27/12 CONSTRUCTION: W.A. C.C. S.E.

entrex  
 COMMUNICATIONS SERVICES, INC.  
 4900 Rockledge Drive, Suite 800  
 Rockledge, FL 32955  
 PHONE: (407) 277-1000  
 FAX: (407) 277-1001

PROJECT NUMBER: 1138.006  
 JOHNSON MEMORIAL - WIMATA RAW LAND  
 10159181 4122  
 JEFFERSON ROAD INT @ WASHINGTON BLVD  
 ARMBURG, VA 22022

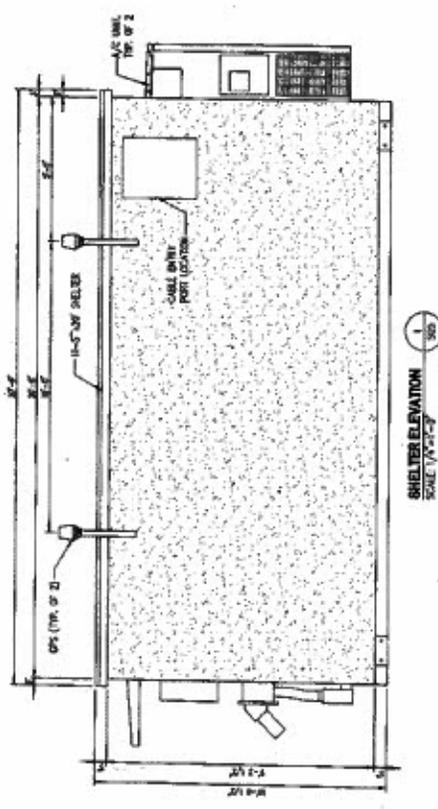
at&t  
 7150 STANDARD DRIVE  
 HANOVER, MD 21076

RF SCHEDULE AND NOTES  
 21182-132  
 21182-132

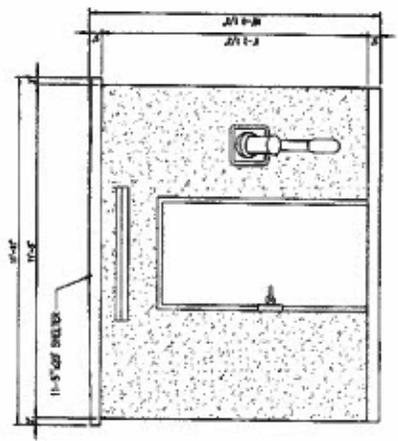




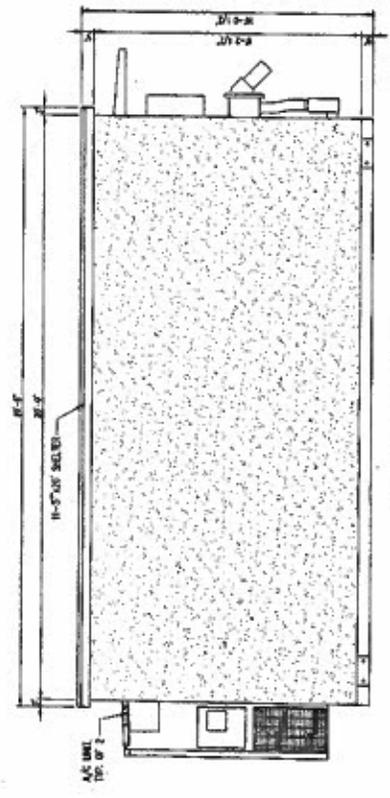




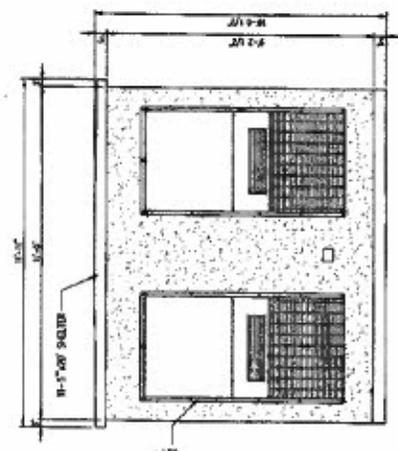
SHELTER ELEVATION  
SCALE: 1/4"=1'-0"



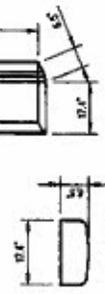
SHELTER ELEVATION  
SCALE: 1/4"=1'-0"



SHELTER ELEVATION  
SCALE: 1/4"=1'-0"



SHELTER ELEVATION  
SCALE: 1/4"=1'-0"



ANTENNA DETAIL  
SCALE: N.T.S.

**entrex**  
www.entrex.com  
11100 W. 10th Street  
Bethesda, MD 20814  
FAX: 301-271-1000

11100.005

**JOHNSON MEMORIAL - WINATA RAW LAND**  
10138151, 4122  
ATTENTION: DAVIS, MEYER & WASHINGTON LLP  
MILWAUKEE, WI 53202

**at&t**  
7100 CENTENNIAL BLVD  
MEMPHIS, TN 38119

NO.	DATE	BY	CHKD.	REVISIONS
1	12/15/05	PK	PK	REVISED WINDSHIELD MOUNTING
2	02/21/07	PK	PK	ADDED WINDSHIELD MOUNTING
3	03/14/07	PK	PK	CONNECTIONS FROM REVISED
4	03/14/07	PK	PK	REVISED

SCALE: AS SHOWN

DESIGNED: C.C. BARNER, P.E.



**EQUIPMENT SHELTER DETAILS**

DATE: 02/21/07

SCALE: 3/8"=1'-0"

PROJECT: JOHNSON MEMORIAL



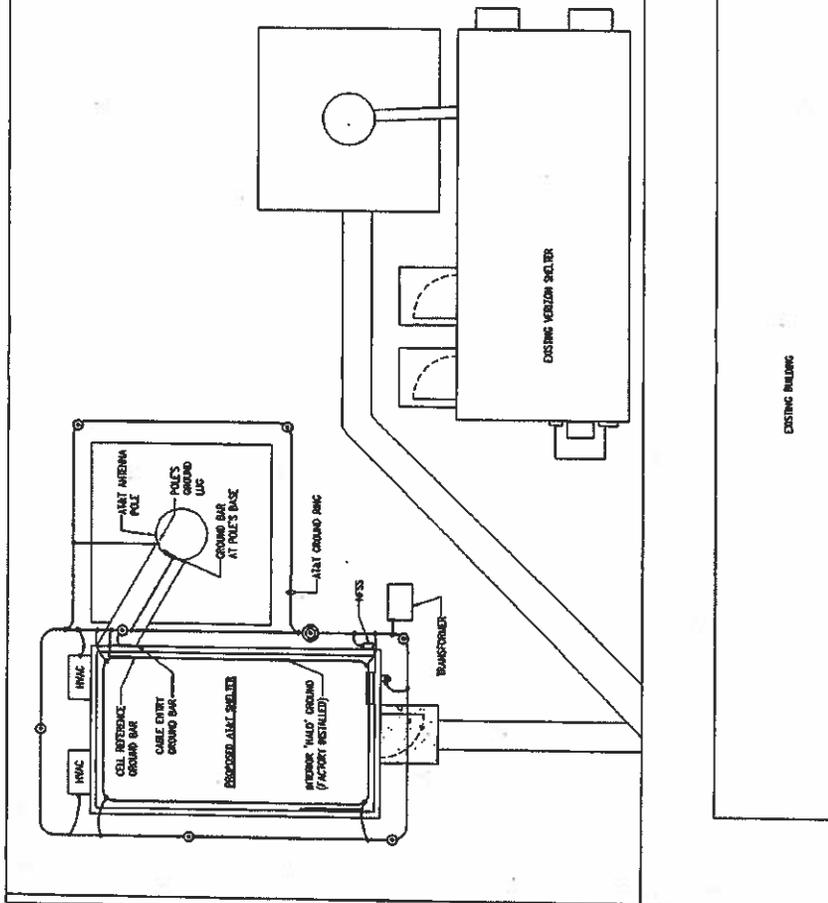




**GROUNDING NOTES**

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1000 AND B1) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. PROPERLY SEQUENCE GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE U.A. APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. STRANDED GROUND WIRES SHALL HAVE GREEN 600 VOLT THIN INSULATION.
6. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
7. ALL GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUNDING BUS SHALL BE #2 AWG SOLID THINNED COPPER UNLESS OTHERWISE INDICATED.
8. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
9. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
10. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
11. ALL GROUND CONNECTIONS ABOVE GRADE SHALL BE FORMED USING HIGH PRESSURE COPPER C-TAPS.
12. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
13. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
14. APPROVED W/THROUGH CASINGS (I.E. CONCRETE OR CAST) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
15. ALL GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
16. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
17. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG THINNED COPPER GROUND CONDUCTOR.
18. DO NOT ROUTE GROUNDING CONDUCTORS THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR. CLIPS AND FASTENERS USED TO SECURE ANY GROUND WIRE SHALL BE NON-METALLIC TO PREVENT "CHOKER EFFECT."

- SHELTER INTERIOR GROUNDING CONNECTION CHECKLIST**
- 1 PANEL #18 TO #10
  - 2 DOOR FRAME TO #10
  - 3 #12 HVC LADDERS TO #10
  - 4 CABLE LADDERS TO #10 (4 LOCATIONS)
  - 5 AIRCRAFT SECTIONS OF CABLE LADDERS TO EACH OTHER
  - 6 CELL RETRIEVAL GROUND BAR TO #10
  - 7 #10 GROUND BAR TO #10



COMPASS PLAN - GROUNDING  
SCALE: 3/8" = 1'-0"

PROJECT NUMBER		1136206	
PROJ. NO.		24781-032	
DESIGNED		C.C.	
DRAWN		A.S.	
CHECKED		C.C.	
APPROVED		C.C.	
DATE		BY DATE	
SCALE AS SHOWN		DESIGNED - C.C.	
DRAWN - A.S.			

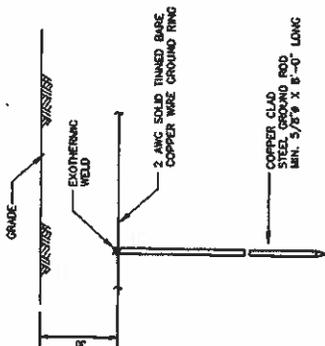
1	BY DATE	REVISION	SCALE
1	BY DATE	REVISION	SCALE
2	BY DATE	REVISION	SCALE
3	BY DATE	REVISION	SCALE
4	BY DATE	REVISION	SCALE
5	BY DATE	REVISION	SCALE
6	BY DATE	REVISION	SCALE
7	BY DATE	REVISION	SCALE
8	BY DATE	REVISION	SCALE
9	BY DATE	REVISION	SCALE
10	BY DATE	REVISION	SCALE

**at&t**  
7150 EDWARDS DRIVE  
INDIANAPOLIS, IN 46216

**JOHNSON MEMORIAL - WIMATA RAW LAND**  
10139161\_0122  
ATTENTION: GUY HAY © WASHINGTON BLDG  
4000 WINDY HILL RD  
INDIANAPOLIS, IN 46202

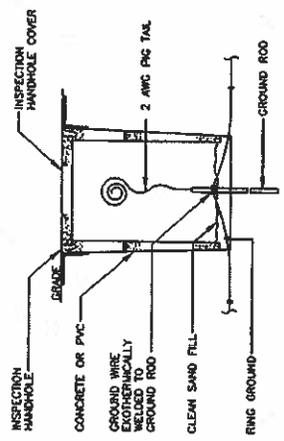
**entrex**  
www.entrex.com  
10000 Rockledge Drive, Suite 200  
Bethesda, MD 20817  
TEL: 301.271.0000  
FAX: 301.271.0001

**GROUNDING PLAN AND NOTES**



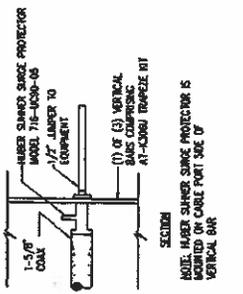
NOTES:  
 1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.

GROUND ROD DETAIL  
 SCALE: 1/4" = 1'-0"

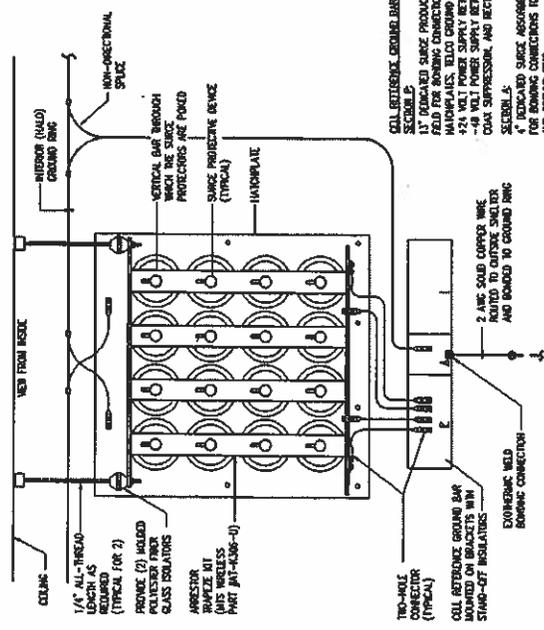


NOTES:  
 INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 6" IN WIDTH/DIAMETER

GROUND ROD WITH ACCESS HANDHOLE  
 SCALE: 1/4" = 1'-0"



NOTES:  
 1. SURGE ARRESTOR SHALL BE MOUNTED ON CABLE PORT SIDE OF VERTICAL BAR



NOTES:  
 1. SURGE ARRESTOR SHALL BE MOUNTED ON CABLE PORT SIDE OF VERTICAL BAR

SURGE ARRESTOR GROUND BAR  
 GROUNDING DETAIL  
 SCALE: 1/4" = 1'-0"

**entrex**  
 COMMUNICATIONS  
 8888 Rockledge Drive, Suite 100  
 Bethesda, MD 20817  
 PHONE: 301-271-9991  
 FAX: 301-271-9991

PROJECT NUMBER:  
 11-31-08  
 JOHNSON MEMORIAL, WRIATA RAW LAND  
 10128151, 4122  
 JETERSON DAM, HWY 8 WASHINGTON BLVD  
 BELMONT, VA 22024

**at&t**  
 THE COMMUNICATIONS  
 COMPANY  
 HARPER, MD 21076

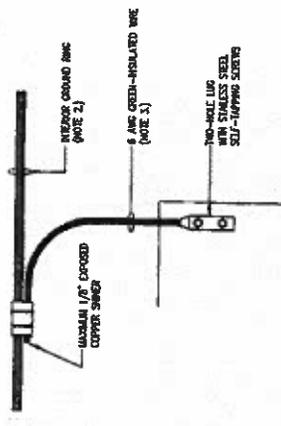
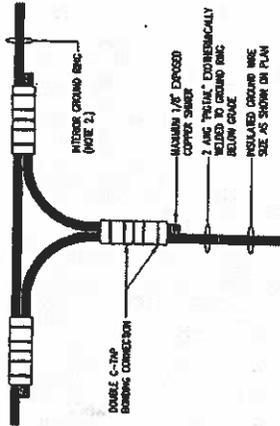
NO.	DATE	REVISIONS	BY	CHK	APP
1	05/05/11	REVISED VERTICAL BAR HEIGHT	W.S.	C.C.	C.C.
2	05/27/11	CONSTRUCTION	W.S.	C.C.	C.C.
3	06/14/11	CONSTRUCTION	W.S.	C.C.	C.C.
4	06/14/11	CONSTRUCTION	W.S.	C.C.	C.C.
5	06/14/11	CONSTRUCTION	W.S.	C.C.	C.C.
6	06/14/11	CONSTRUCTION	W.S.	C.C.	C.C.

SCALE: AS SHOWN  
 DESIGNED: C.C.  
 DRAWN: A.S.

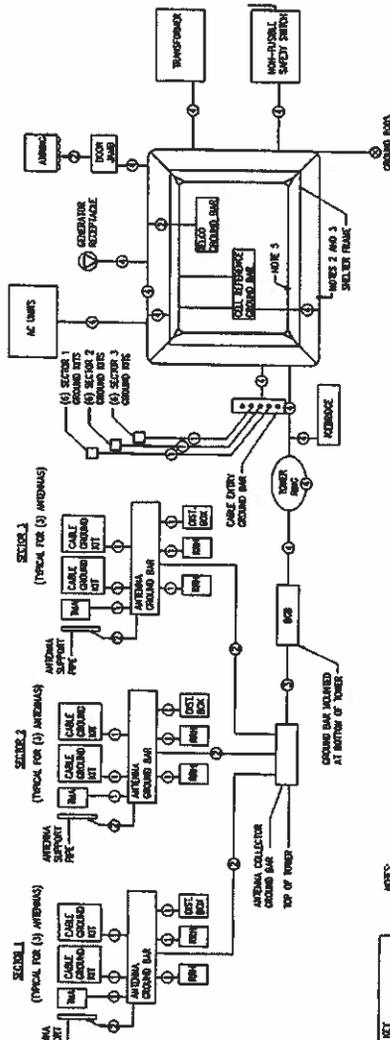
GROUNDING DETAILS  
 SHEET NO. 21482-432  
 DRAWING NUMBER: 01482

**INTERIOR GROUNDING NOTES**

1. REFER TO ELECTRICAL SHOP DRAWINGS TO VERIFY GROUNDING CONNECTIONS PROVIDED FACTORY-INSTALLED AND GREEN-INSULATED STRANDED COPPER WIRE.
2. FOLLOWING TIES TO THE MAIN GROUND BNC:
3. 6 AWG BONDING JUMPER SHALL BE PROVIDED TO BOND THE FOLLOWING ITEMS TO THE MAIN GROUND BNC:
  - a. METAL ENCLOSURES OF POWERED PD
  - b. AC LOADS (BOND LOADS TO LOADS WITH SS SELF-TAPPING SCREWS)
  - c. AC LOADS (BOND LOADS TO LOADS WITH SS SELF-TAPPING SCREWS)
  - d. CABLE LADDERS
  - e. CABLE ENTRY PANEL.



**SHIELDER INTERIOR BONDING DETAILS**  
SCALE: N.T.S.



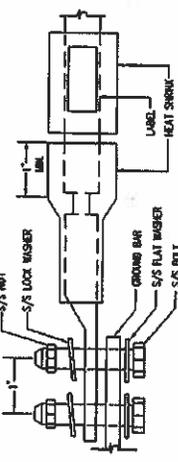
- NOTES:**
1. BOND ANTENNA GROUNDING BY CABLE TO GROUND BAR.
  2. 2 AWG (COLD WOUND) COPPER BARE GROUND BNC.
  3. THE GROUNDING CONNECTION AND DETAILS SEE LAYOUT DRAWINGS.
  4. INSTALL GROUND BNC AT LOCATIONS AS SHOWN ON GROUNDING PLAN.
  5. PROVIDE GROUND BNC FOR EQUIPMENT BY SHIELDER MANUFACTURER.

**SCHEMATIC DIAGRAM - GROUNDING SYSTEM**  
SCALE: N.T.S.



C-TAP COPPER CONNECTION FOR CONNECTING TWO COPPER CONDUCTORS TOGETHER COMPRESSED WITH A HYDRAULIC CRIMP TOOL. MANUFACTURER: HARGREAVES, W.C. SERIES: C1. NO SUBSTITUTES WILL BE ACCEPTED.

**C-TAP BONDING CONNECTION**  
SCALE: N.T.S.



- LUG NOTES:**
1. ALL HARDWARE IS 16-8 STAINLESS STEEL INCLUDING LOCK WASHERS.
  2. ALL HARDWARE SHALL BE 5/8\"/>

**LUG DETAIL**  
SCALE: N.T.S.

**entrex**  
Communication Services, Inc.  
www.entrex.com  
1000 Rockledge Drive, Suite 100  
Baltimore, MD 21207  
PHONE: (410) 546-0881  
FAX: (410) 546-0881

PROJECT NUMBER: 1135.006

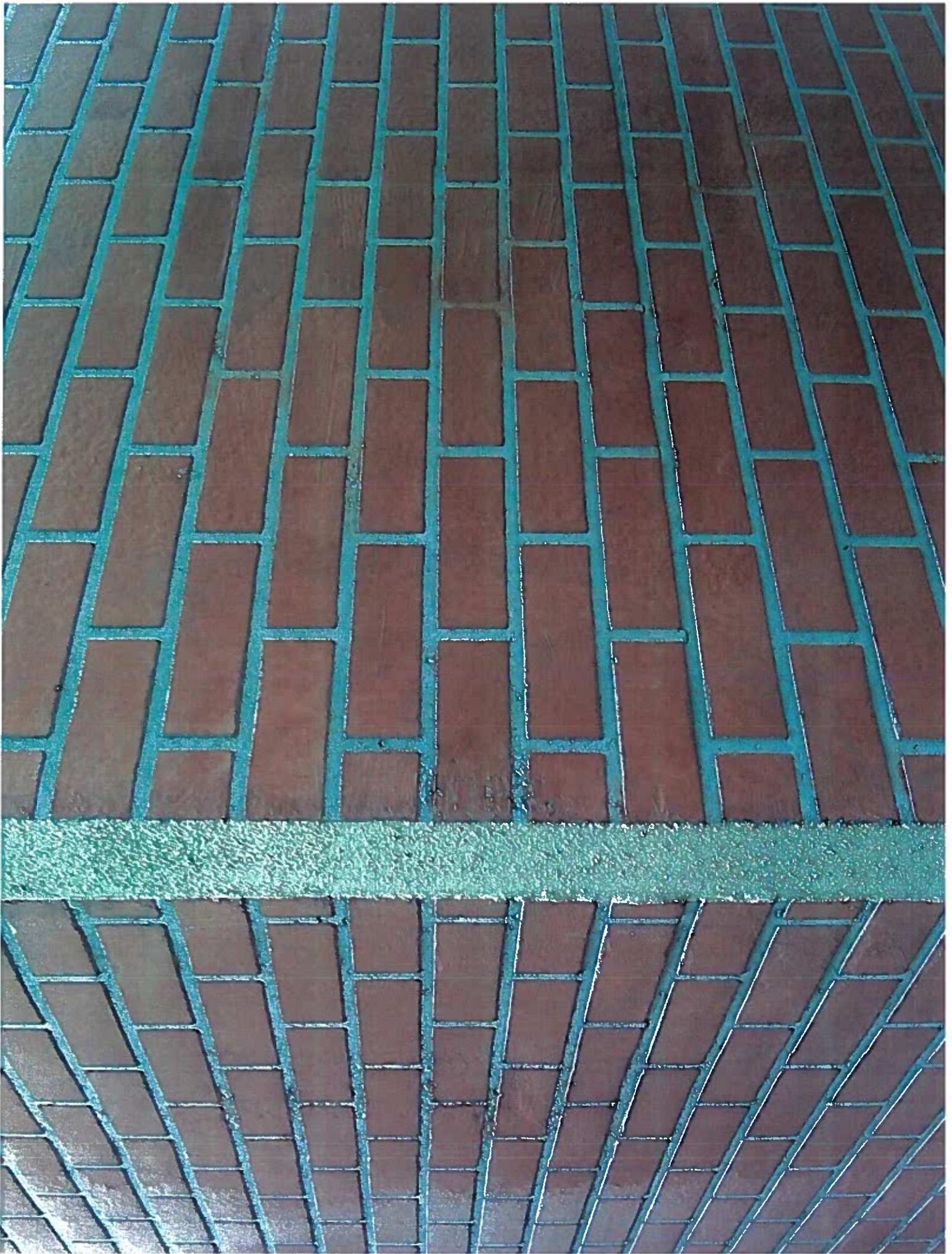
JOHNSON MEMORIAL - WAMATA RAW LAND  
10138751.4122  
JEFFERSON DRMS, HWY 8 WASHINGTON BLVD  
ARLINGTON, VA 22202



REV	DATE	BY	CHK	DESCRIPTION
1	01/26/12	REVISOR	C.C.	REVISION: C.C.
2	07/17/12	DESIGNER	C.C.	REVISION: C.C.
3	07/17/12	DESIGNER	C.C.	REVISION: C.C.
4	07/17/12	DESIGNER	C.C.	REVISION: C.C.
5	07/17/12	DESIGNER	C.C.	REVISION: C.C.

SCALE AS SHOWN  
DESIGNED: C.C.  
DRAWN: A.S.  
DATE: 01/26/12  
JOB NO.: 24162-132  
SHEET NUMBER: 025

**GROUNDING DETAILS AND DIAGRAM**





## **Maximum Permissible Exposure Analysis**

For

### **Johnson Memorial**

1001 Jefferson Davis Hwy,  
Arlington, VA 22202.

Submitted by:

**Shashikanth Sena**  
RF Engineer

Reviewed by:

**Sandeep Gupta**  
RF Design Manager

Approved by:

**Sean Miller**  
RF Performance Manager  
AT&T Mobility  
7150 Standard Drive  
Hanover, MD  
Tel: 410-712-7744  
**Fax: 410-712-7784**



**RF EXPOSURE REPORT SUMMARY**

**Johnson Memorial  
1001 jefferson Davis Hwy,  
Arlington, VA, 22202.  
(Construction Number: 4122)**

**I. Executive Summary**

The RF nature of cellular system is non-ionizing, which means the RF exposure will not change the atomic structure of exposed objects so as a result, the exposure will create heat effects on the objects. Thus, the Federal Communication Commission has issued guidelines and regulations, 47 C.F.R Sec. 1.1310 and FCC OET bulletin 65, regarding maximum permissible human exposure to radio frequency electromagnetic fields.

Each proposed system configuration change that will alter the electromagnetic field in an accessible area must be examined, to ensure compliance with all applicable rules and regulations. Thus, a RF exposure study has to be conducted.

This study uses a mathematical model (based upon FCC-approved formulas and methods) to predict RF exposure levels near the transmitters. The input parameter values are the intense values, which give the worst condition/result.

Below is the summary of the RF exposure affecting by the configuration of the proposed site, Stevenson, in the area nearby the transmitters.

**Sector 1, 2 and Sector 3 (Alpha, Beta and Gamma):**

The observation height is 7' from the ground, the RF emission level is much lower than the uncontrolled level, and so it will be expected for not having RF emission problem from AT&T Mobility system. This is due to the way of mounting the antennas, which is mounted to tree pole at 50 feet; MPE propagation ran on 50 ft RC. It will prevent general public to be around the antenna in normal condition. There is no ready access to this general location. There are no nearby buildings or ground level locations within range of the MPE limits.

But in certain case, for instance, during monopole maintenance nearby the antennas, the property management has to inform AT&T Mobility to turn off the transmitter (**Exactly in front and till 15 ft below RC of the antenna**, 35 ft distance has to be fulfilled with maximum 30 minute exposure time continuously for persons **who are fully aware of the potential for the exposure and can exercise control over their exposure**).

**II. Engineering Data**

	<b>Alpha</b>	<b>Beta</b>	<b>Gamma</b>
<b>Sector Azimuth</b>	340	100	220
<b>Estimated Antenna Radiation Center</b>	50	50	50
<b>Antenna Mounting</b>	50 AGL on Treepole	50 AGL on Treepole	50 AGL on Treepole
<b>Antenna Model</b>	P45-16-XLH-RR	P45-16-XLH-RR	P45-16-XLH-RR
<b>Antenna Manufacture</b>	Powerwave	Powerwave	Powerwave
<b>Max Power at the antenna</b>	250 Watt	250 Watt	250 Watt
<b>Max. Channel Amount deployed (GSM/UMTS)</b>	6/2	6/2	6/2
<b>Technology</b>	UMTS/LTE	UMTS/LTE	UMTS/LTE



### III. Analysis

The analysis was done using a mathematical model with the engineering data mentioned above.

The values of the engineering data above are not the values, which AT&T Mobility will deploy but are selected to produce the **worst scenario** that could happen at the site due to the system configuration. In addition, the study is done based on the main beam characteristic of the antenna, which produce the most concentration of RF Emission.

On the other hand, this analysis cannot give a prediction to the effect due to some external systems, which are not AT&T Mobility cellular equipments.

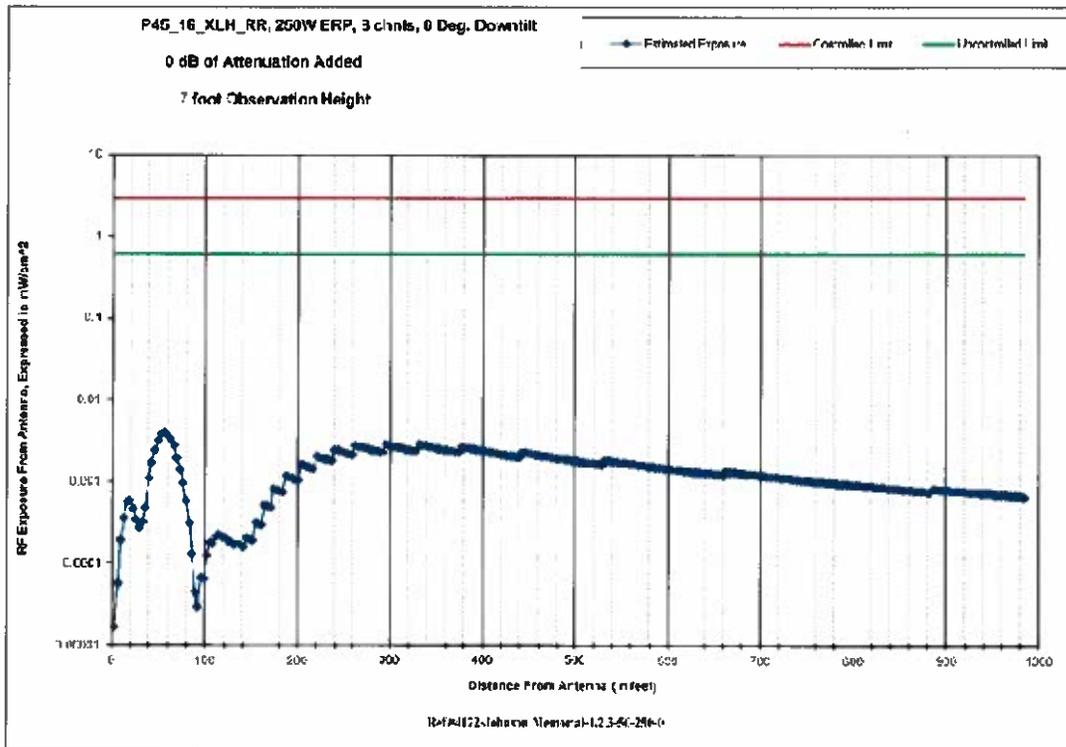
The graphs show the signal density level at the observation height (rooftop -7' or ground level + 7'); which the human height is considered 7 feet height.

The charts show the exceeding RF emissions against distance and height for the uncontrolled exposure/general public on the top portion, and for the controlled exposure/Occupational person on the bottom portion.



**Sector 1 (Alpha):**

**Graph of Exposure at Observation Height**



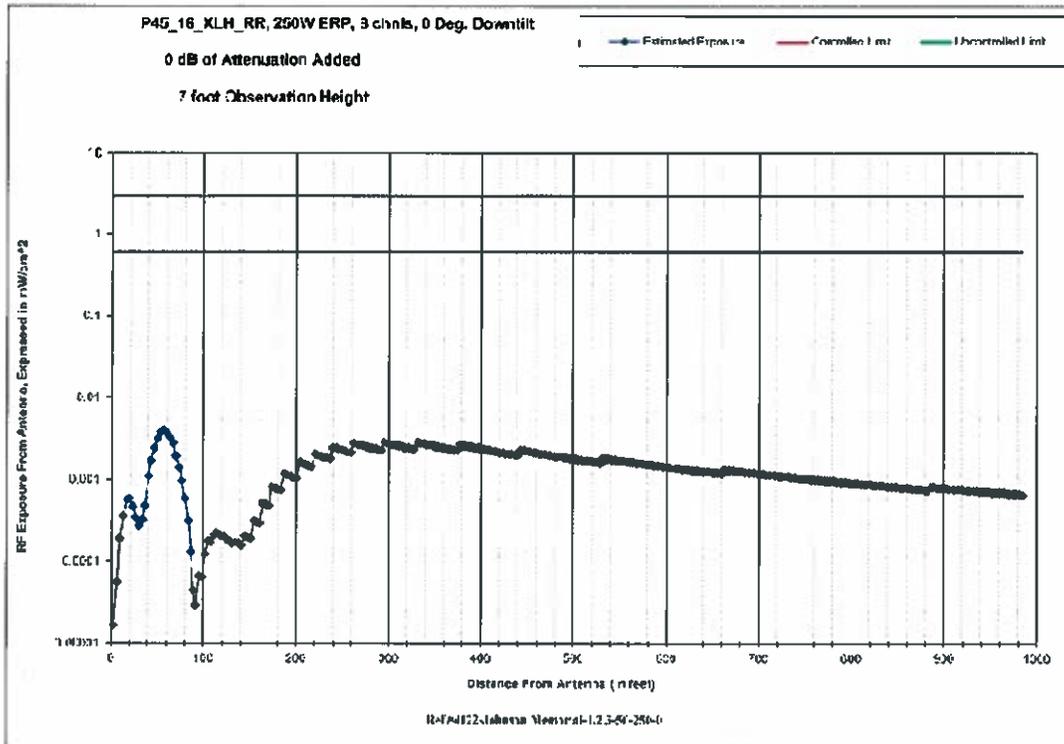
**Graph 1. Signal Density level at the observation height, ground level.**



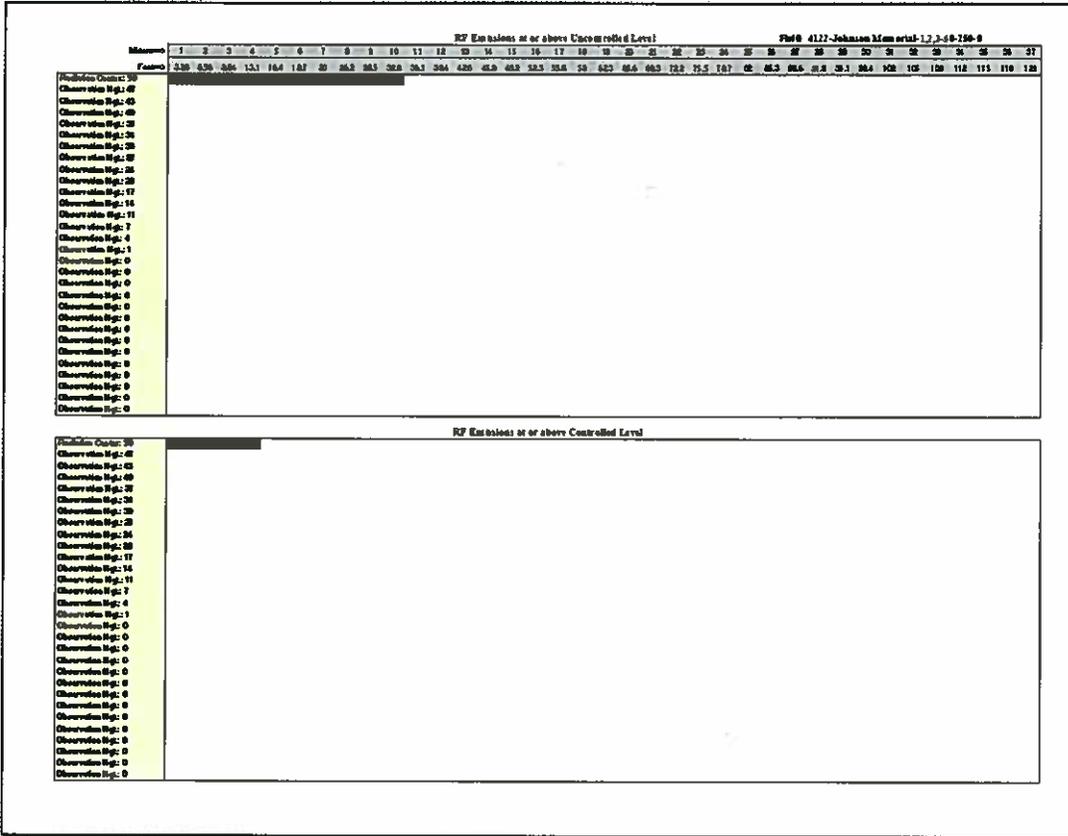


**Sector 2 (Beta):**

**Graph of Exposure at Observation Height**



**Graph 1. Signal Density level at the observation height, ground level.**

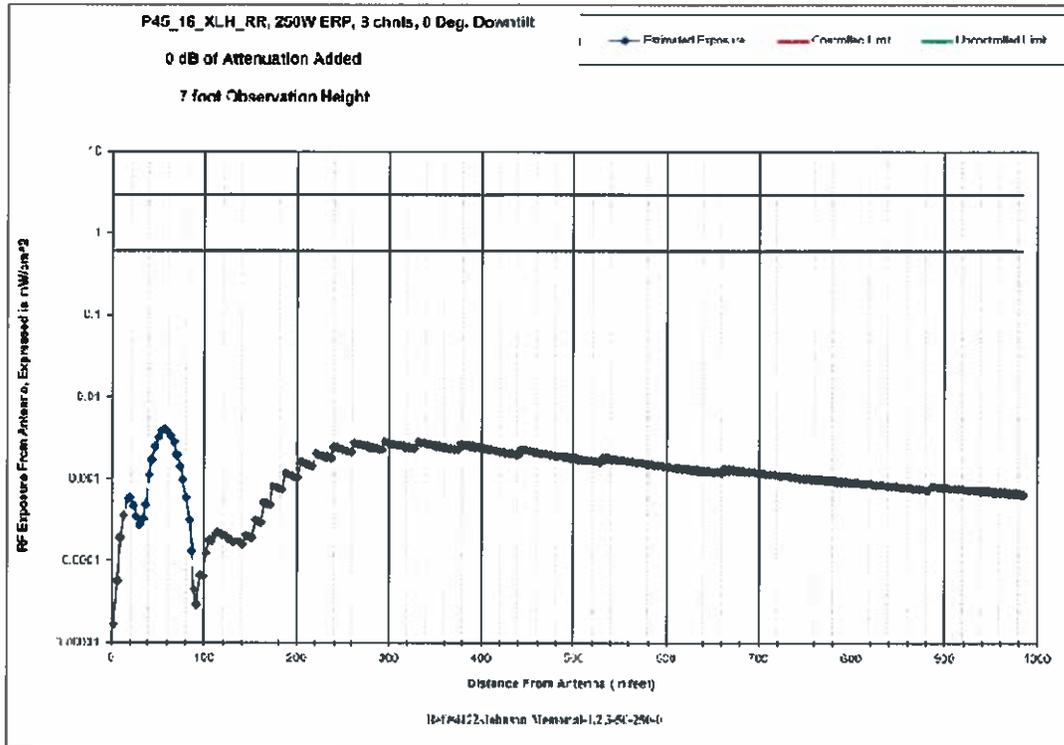


**Chart 1. Exceeding RF Emission for controlled and uncontrolled level**



**Sector 3 (Gamma):**

**Graph of Exposure at Observation Height**



**Graph 1. Signal Density level at the observation height, ground level.**

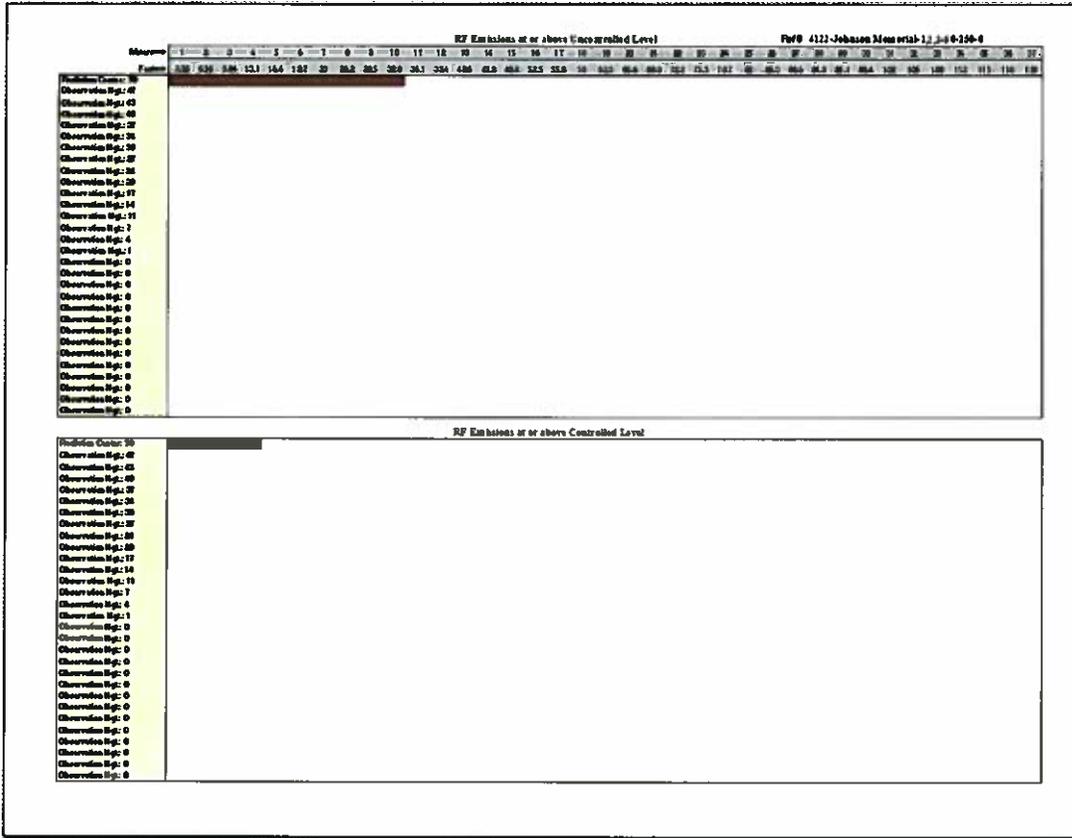


Chart 1. Exceeding RF Emission for controlled and uncontrolled level



**Conclusion:**

**Sector 1, 2 and Sector 3 (Alpha, Beta and Gamma):**

The observation height is 7' from the ground, the RF emission level is much lower than the uncontrolled level, and so it will be expected for not having RF emission problem from AT&T system. This is due to the way of mounting the antennas, which is mounted on a platform at an RC of 50 ft AGL on the proposed treepole; it will prevent general public to be around the antenna in normal condition. There is no ready access to this general location. There are no nearby buildings or ground level locations within range of the MPE limits.



#### **IV. RF Exposure Methodology**

##### **Purpose of this Study:**

The Federal Communications Commission has issued rules and regulations regarding maximum permissible human exposure to radio frequency electromagnetic fields. Each proposed configuration change that will alter the electromagnetic field in an accessible area must be examined, to ensure compliance with all applicable rules and regulations. This study is prepared to fulfill the examination requirement for one such proposal, and specifies where applicable limits may be exceeded.

---

##### **Definition of Terms used in this Document:**

###### **Maximum Permissible Exposure (MPE)**

For each frequency, the FCC has defined specific permissible rules for human exposure to radio frequency electromagnetic fields. These rules establish upper limits for the composite field strength to which humans may be exposed. The Office of Engineering and Technology (OET) Bulletin 65 Edition 97-01 defines MPE as "the rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed, without harmful effect and with an acceptable safety factor."

The responsibility of transmitter operators to operate within the maximum permissible field envelope is set forth in Title 47 of the Code of Federal Regulations (CFR) 1.1307(b): "Actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitter's contribution to the RF environment at the non-complying area exceeds 5% of the exposure limit in terms of power density."

###### **Uncontrolled (General Population) Exposure**

Adapted from OET Bulletin 65, Uncontrolled Exposure is "the MPE in situations where the general public may be exposed, or in situations where persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure." Since the general population may have no knowledge of the potential for exposure, and therefore cannot take appropriate measures, the standards for uncontrolled exposure are the most severe.

###### **Controlled (Occupational) Exposure**

Adapted from OET Bulletin 65, Controlled Exposure is "the MPE in situations where persons are exposed as a consequence of their employment, and those persons are fully aware of the potential for exposure and can exercise control over their exposure." Since those involved in controlled situations have appropriate equipment and training, the standards for controlled exposure are more relaxed than for uncontrolled exposure.

###### **Power Density**

Adapted from OET Bulletin 65, "Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter, or for convenience, units such as milliwatts per square centimeter or microwatts per square centimeter. For plane waves, power density, electric field strength, and magnetic field strength are related by the impedance of free space".



### Derivation of Applicable Formulas:

Per FCC regulations, Power Density ( $S$ ) is defined by

$$S \text{ (expressed in } \mu\text{W / cm}^2\text{)} = \frac{33.4 F^2 ERP}{R^2} \quad (1)$$

Where the following units are used:

- $F$  = Relative field factor (gain relative to the main beam)
- $ERP$  = (Total) effective radiated power, expressed in watts
- $R$  = Distance from the center of radiation of the antenna, expressed in meters

When multiple channels/carriers are used in a sector, the composite power density is determined by multiplying the ERP per channel/carrier by the number of channels/carriers.

### Allowed Power Density for Uncontrolled Exposure

As noted above, the standard for general population/uncontrolled exposure is stricter than for controlled exposure. For the general population/uncontrolled case, the FCC determines the MPE limit by the following:

$$S_{\text{Uncontrolled Limit}} \text{ (expressed in } \mu\text{W / cm}^2\text{)} = \frac{f}{1.5} \quad (2)$$

Where  $f$  = transmitting frequency, expressed in MHz.

As noted above, CFR 1.1307(b) holds each carrier liable for restoring compliance with the MPE regulations, in areas where the limits are exceeded, and where that carrier is contributing 5% or more of its individual MPE. The 5% level may be easily determined from Equation (2):

$$S_{5\% \text{ Uncontrolled}} \text{ (expressed in } \mu\text{W / cm}^2\text{)} = 5\% \text{ of } \left(\frac{f}{1.5}\right) = \left(\frac{1}{20}\right) \frac{f}{1.5} \approx 0.0333f \quad (3)$$

Cellular transmits channels span a whole range of frequencies. From Equation (2), it is clear that the most conservative ("worst case") MPE power density occurs for the smallest possible value of  $f$ . In the case of Band "A" cellular, the most conservative case occurs when  $f = 869.04$  MHz (the lowest frequency in Band "A"),

Applying  $f = 869.04$  MHz to Equation (2) yields the most conservative MPE for Band "A" cellular operations:



$$S_{5\% \text{ Uncontrolled}} \text{ (expressed in } \mu\text{W / cm}^2\text{)} \approx \frac{f}{15} = \frac{869.04}{1.5} = 579.360 \quad (4)$$

Applying  $f = 869.04$  MHz to Equation (3) yields the most conservative 5% Power Density MPE for Band "A" cellular operations:

$$S_{5\% \text{ Uncontrolled}} \text{ (expressed in } \mu\text{W / cm}^2\text{)} \approx 0.0333f = 0.0333(869.04) = 28.968 \quad (5)$$

Using the limit value determined in Equation (5), and substituting this value into Equation (1), it is possible to determine a unique 5% MPE Limit Radius  $R$  for each cell configuration (this is true because each sector of each cell has a fixed Effective Radiated Power ( $ERP$ ), and the appropriate Relative Field Factor  $F$  can be determined from the radiation pattern of the antenna selected):

$$R \text{ (expressed in meters)} = \sqrt{\frac{33.4 F^2 ERP}{28.968}} \quad (6)$$

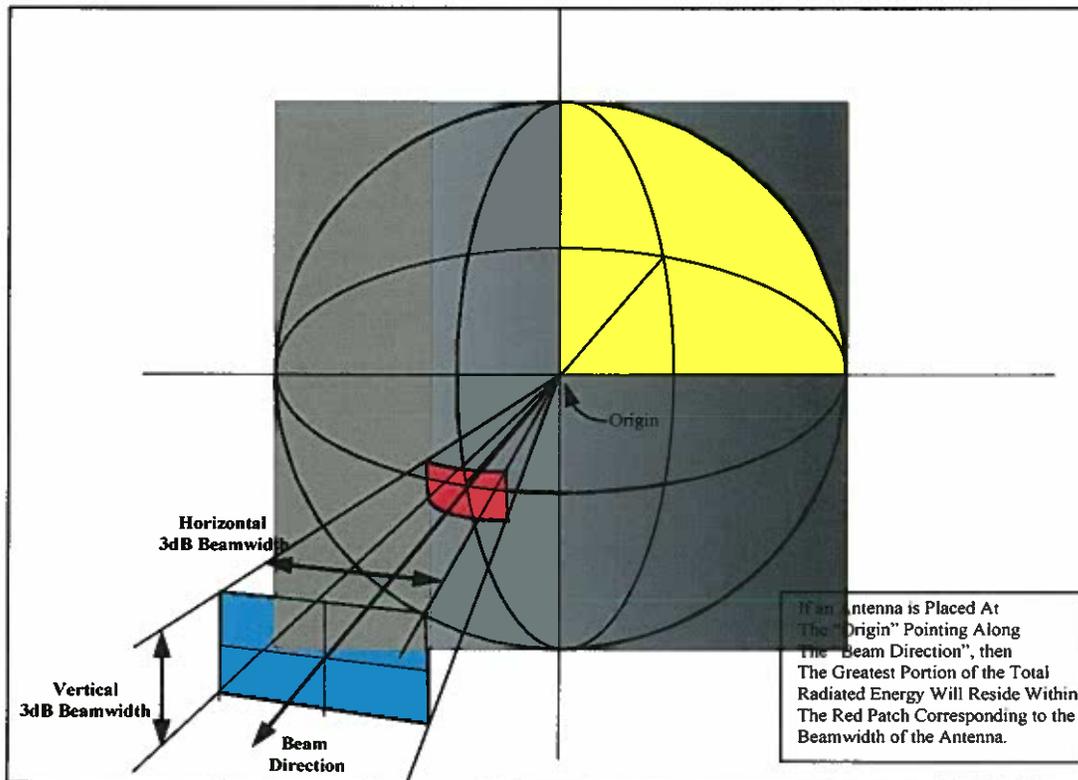
The 5% MPE Limit radius is used to establish a Contour around the antenna installation.

## Antenna Considerations

The discussion thus far has concerned only two-dimensional radiation patterns; real antennas operate in three dimensions. In addition, cellular installations often involve multiple sectors.

It can be shown that, generally, each sector can be studied for MPE compliance in isolation; there is typically no need to consider the electromagnetic contribution of the other sectors. According to FCC rules (as set forth in FCC 97-303), "When applying the criteria...radiation in all directions should be considered. For the cases of transmitting facilities using sectorized transmitting antennas, applicants and licensees should apply the criteria to all transmitting channels in a given sector, noting that for a highly directional antenna there is relatively little contribution to ERP or EIRP summation for other directions."

Two of the most important specifications of an antenna are its 3dB *vertical beamwidth* and its 3dB *horizontal beamwidth*. By definition, *beamwidth* refers to the arc (usually expressed in degrees) between the antenna's two 3db points; the 3dB points occur where the transmitted power has fallen off to half the value of the main beam peak. Thus, the horizontal and vertical beamwidths together define a "cone" that contains the most significant portion of the total transmitted power, often, say, 80% of the total. All of the remaining power is dispersed in other directions around the antenna. In cellular operations, it is common for directional antennas to have vertical beamwidths of, say, 15 degrees and horizontal beamwidths of, say, 80 degrees. Thus, the antenna establishes a strong power density in the "pointing direction" of the antenna, but a much weaker power density along all other "side" vectors. Usually, the power in the sum of the "side" lobes from even several antennas is small when compared to the power of the main beams. It is for this reason that the FCC writes, "there is relatively little contribution to ERP or EIRP summation for other directions".





**Figure 1: Antennas Do Not Radiate Equally in All Directions, but Rather Concentrate Emissions in a Small Area**

Equation (1) makes several assumptions. Among these, the equation includes the EPA-recommended 1.6-fold increase in field strength (or 2.56-fold increase in power density) that might result from ground reflections. The equation does not, however, make any allowances for buildings or other obstructions. The FCC recommends that "for rooftop locations it is also important to note that exposures inside a building can be expected to be reduced by at least 10-20 dB due to attenuation caused by building materials in the walls and roof." In practice, it is very difficult to factor the FCC-recommended attenuation into Equation (1), since the attenuation applies only to those segments of those vectors that actually pass through a structure. Instead, it is easier to apply Equation (1), in two different ways, to each case. First, Equation (1) is applied in a general way, to estimate the outdoors free-space field strength around the transmitter. Then, Equation (1) is applied *with the ERP reduced by 10dB*; to conservatively simulate the attenuation caused by building materials. The result of this process is numerically the same factoring a 10dB building material loss (with the ERP at its actual value). **THE RESULTS OF THIS SECOND APPLICATION OF EQUATION (1) APPLY ONLY WITHIN THE BUILDING AND TO OTHER SIMILARLY "SHADOWED" REGIONS!** Generally speaking, the second use of Equation (1) will show that there are no points within the building that are of concern.

## Calculation Method

Equation (1) shows that the field strength  $[S]$  at any given point  $[x]$  is a function of transmitter power  $[ERP]$ , distance from the antenna  $[R]$ , and antenna pattern  $[F]$ .

For the purposes of evaluating MPE compliance, it is convenient to use Equation (1) in conjunction with a computer spreadsheet. In this way, it is possible to quickly evaluate compliance at many different points in space.

To specify a point in space; a coordinate system of some sort is required. For MPE calculations, it is convenient to use a rectangular coordinate system, with one axis (called *distance*) along the ground, and the other, orthogonal axis (called *height*) passing vertically through the antenna. Using this coordinate system, it is possible to uniquely specify each point  $x$  as a function of distance  $d$  and height  $p$ . See Figure 2.

There is a vector from the radiation center of the antenna to each point  $x$ . Simple geometry is all that is needed to determine the magnitude (length) of the vector  $R$ ; its direction (specified as *Angle*) is calculated using the arctangent function. Recall that  $R$  is required to solve Equation (1).

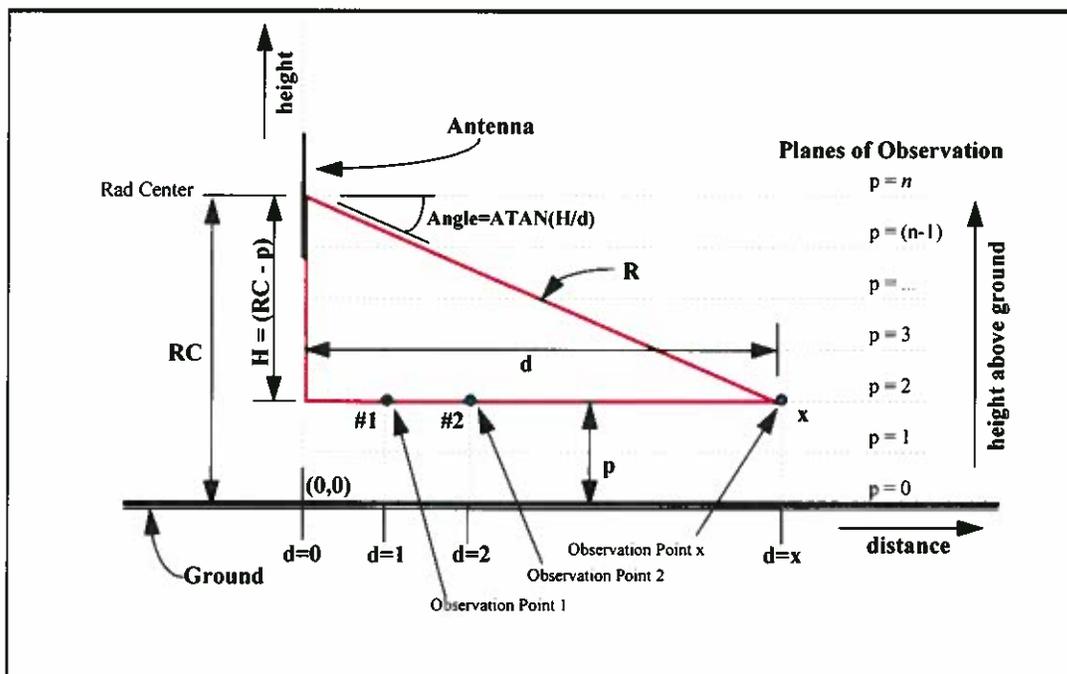


Figure 2: Point  $x$  is specified As A Function of Distance and Height

To further simplify calculations, it is convenient to employ *planes of observation*; that is, it is handy to fix the height while considering only those observation points that lie along a single plane. By fixing  $p$  while varying  $d$ , it is possible to calculate the MPE values along a particular plane. This process may be repeated for various values of  $p$  to build up a full spatial model of MPE values.



It may be recalled that Equation (1) contains a "field factor"  $F$  that accounts for the radiation pattern of the antenna. Radiation patterns are provided by each manufacturer for each model of antenna; it is only necessary to "look up" the correct value of  $F$  for the particular angle of interest. It may be recalled from the discussion above that **Angle** is obtained while calculating the magnitude of vector  $R$ . By using **Angle** in conjunction with an appropriate antenna database, it is easy to look up a value for  $F$ . See Figure 3.

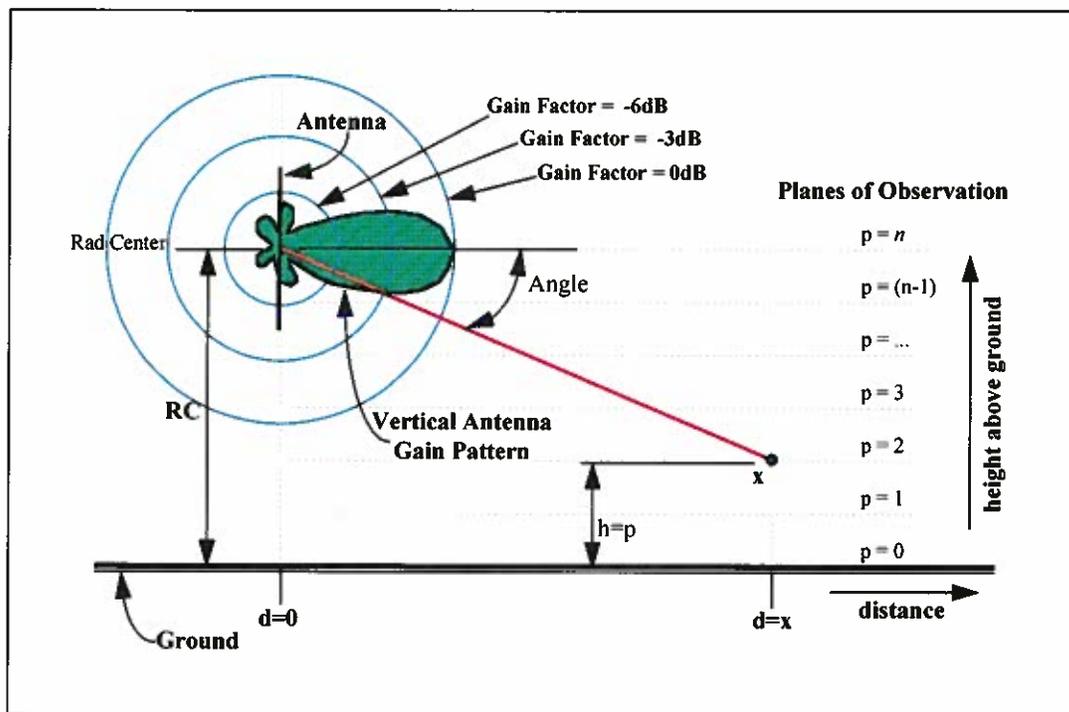
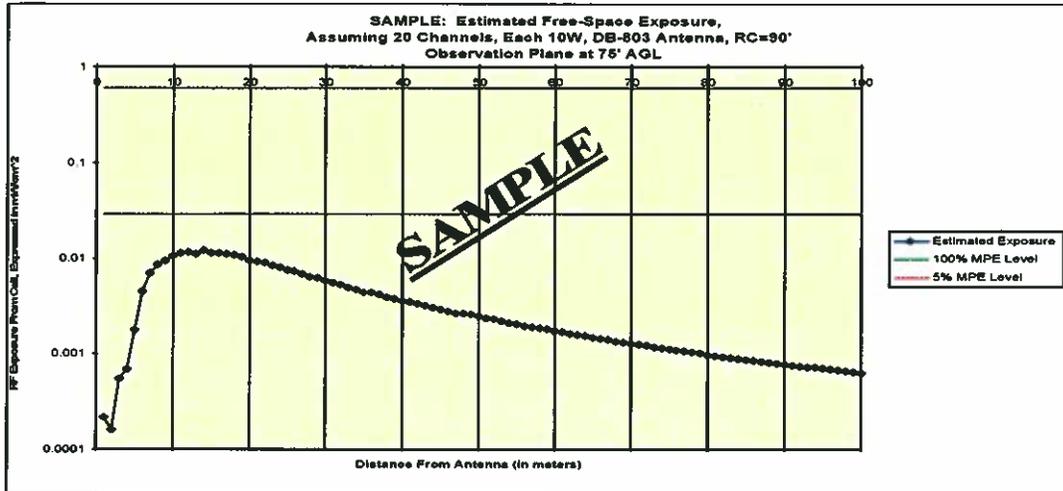


Figure 3: The Appropriate Field Factor at Point  $x$  is -3dB

The output of the spreadsheet is a graph, such as the sample shown below in Figure 4. The graph shows the 100% and 5% MPE levels, as well as the calculated exposure values produced for the case under consideration. In the example shown in Figure 4, the 5% MPE level and the 100% MPE levels are never exceeded. The values in the sample graph are valid for a plane 15' below the radiation center of the antenna.



**Figure 4: Sample Output of MPE Calculation**



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### **Calculations & Results for This Case**

Because the antennas at "" will be mounted 98' above AGL, the MPE calculations for this location are comparatively simple. The goal of the calculations is to locate any areas where the 100% or 5% MPE limits might be exceeded. To accomplish the goals, an exposure scenario was examined for each sector: Exposure scenarios were reviewed at and near Radiation Center, and near ground where any likely exposure to people will occur.

#### **(CASE 1) Ground Level Exposure**

All three sectors were examined independently. There is no point on the ground where the 100% or 5% MPE levels are exceeded. The results of the attached spreadsheets indicate that for the conditions modeled the 100% MPE or the 5% MPE, will not be achieved at any point on the observation plain (7 feet above AGL).

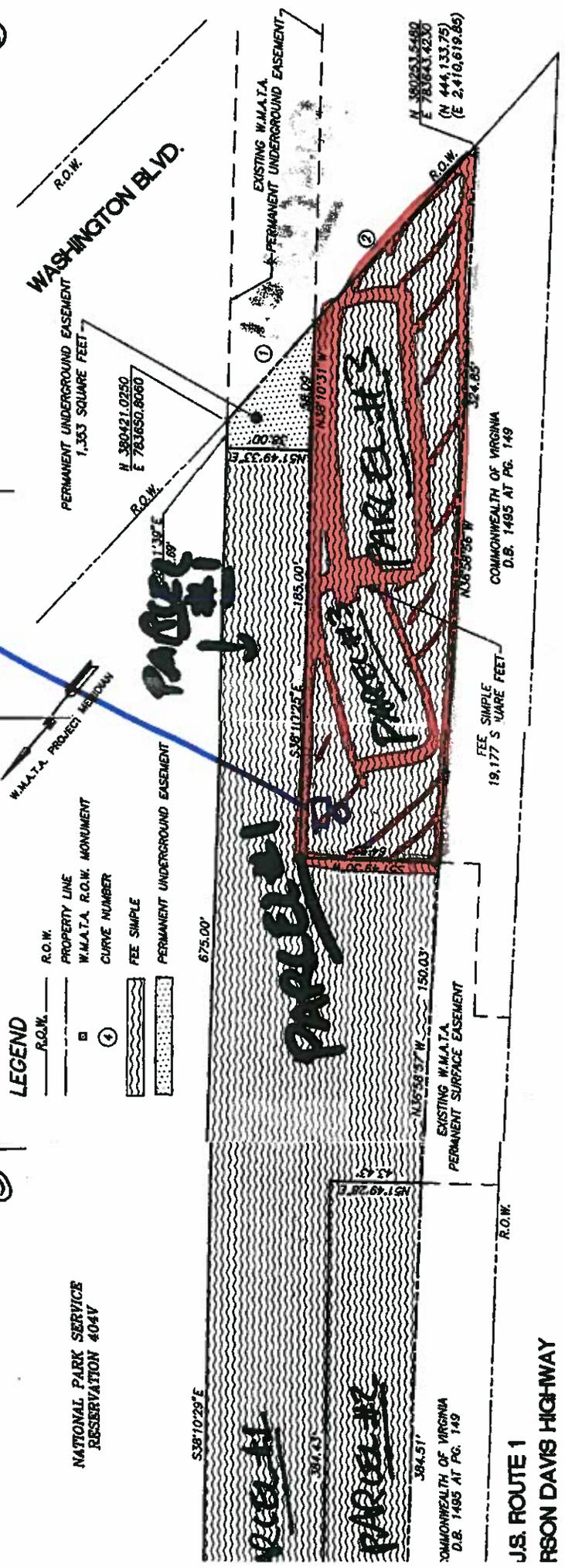
#### **(CASE 2) Plane Passing through Radiation Center**

An observation level was considered at the radiation center of the antenna of each sector (the worse case scenario) to show the point (or general area) where an individual would need to be to exceed the 100% and 5% MPE level. Exposure levels were studied at 3 feet intervals, starting at radiation center, moving down in elevation until no MPE levels were exceeded. This is used to define the areas where MPE limits are exceeded. An Excel spreadsheet for each sector has been included in documentation to show the heights and points exceeding the 5% MPE levels.



**LOCATION OF PROPOSED TELECOM FACILITY (K-5390-12-1)**

③



**LEGEND**

- R.O.W.
- PROPERTY LINE
- W.M.A.T.A. R.O.W. MONUMENT
- ④ CURVE NUMBER
- FEE SIMPLE
- PERMANENT UNDERGROUND EASEMENT

CURVE	RADIUS	LENGTH	TANGENT	CHORD
1	4015.00'	59.213'	28.607'	59.21'
2	4015.00'	108.44'	54.223'	108.43'
3	1136.28'	40.033'	20.016'	40.03'
4	1136.28'	85.577'	42.784'	85.54'

BEARING	DELTA
S01°45'10" W	00°50'42"
S02°38'44" W	05°04'08"
N37°02'04" W	02°01'27"
N32°52'08" W	00°53'53"

VC 118  
Coble ②

EXHIBIT A  
SHOWING FEE PARCELS AND AN EASEMENT ON THE PROPERTY OF THE NATIONAL PARK SERVICE ARLINGTON COUNTY, VIRGINIA

SCALE: 1"=40'  
DRAWN BY: J.M. VETTER  
CHECKED BY: J.M. VETTER

DATE: 04/01/98  
BY: J.M. VETTER  
CHECKED BY: J.M. VETTER

VC 118  
Coble ③

J.S. ROUTE 1  
ROSON DAVIS HIGHWAY

NATIONAL PARK SERVICE  
RESERVATION 404V

COMMONWEALTH OF VIRGINIA  
D.B. 1485 AT PG. 149

COMMONWEALTH OF VIRGINIA  
D.B. 1485 AT PG. 149

**From:** [AHCA President](#)  
**To:** [Marco Rivero](#)  
**Subject:** Re: U-3340-12-1 Use Permit 50" Telecom Pole & Equipment  
**Date:** Saturday, June 23, 2012 1:25:58 AM  
**Importance:** High

---

Marco,

The Aurora Highlands Civic Association has no objection to the proposal as stated in the application and concurs with staff recommendations regarding enhanced landscaping.

If you require anything further, please contact me anytime via email or on (703) 867-8976.

Regards,

Jim Oliver, President  
Aurora Highlands Civic Association

On Jun 19, 2012, at 1:25 PM, Marco Rivero wrote:

Hello,

As a follow-up, this request was deferred by the County Board in May 2012 because staff requested more information regarding the site including an EME report and increased landscaping on the site. These issues have been addressed.

Thanks,  
Marco

**Marco Antonio Rivero**  
*Associate Planner*

All correspondence sent to and from Arlington County Government is subject to the public record laws of the Commonwealth of Virginia.

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**From:** Marco Rivero  
**Sent:** Tuesday, June 19, 2012 1:24 PM  
**To:** [ahcapresident@gmail.com](mailto:ahcapresident@gmail.com); [afox@crystalcity.org](mailto:afox@crystalcity.org)  
**Subject:** U-3340-12-1 Use Permit 50' Telecom Pole & Equipment  
**Importance:** High

Good afternoon,

I am writing in regards to a new use permit request by New Cingular Wireless (AT&T Mobility) to install a 50' telecommunications pole (54' from grade to top of antennas)

and an equipment shelter adjacent to an existing WMATA traction station and Verizon Wireless cellular base station and pole (which began operation in 2008), located at the intersection of Jefferson Davis Hwy (Rte. 110) and Washington Blvd, which is north of the Pentagon (**U-3340-12-1: Jefferson Davis Hwy & Washington Blvd**). Staff is currently reviewing the application.

The site is located on WMATA property (regional entity) and is also governed by the WMATA Compact. Section 75 of the Compact states that *"The Board shall comply with all laws, ordinances and regulations of the signatories and political subdivision and agencies thereof with respect to use of streets, highways, and all other vehicular facilities, traffic control and regulation, zoning, signs and buildings."* Therefore, Arlington County Zoning laws apply to this request per the Arlington County Zoning Administrator. The United States Department of the Interior, Arlington National Cemetery, and WMATA have reviewed this application and do not object to move forward with this use permit request.

Attached is a copy of the application materials and the electromagnetic energy site compliance report submitted by AT&T Mobility. Even though this property is not within the boundaries of any particular neighborhood or civic/citizen association, staff would like to inform you of this request. Please let me know if you have any questions. **The item will be advertised for the July 21, 2012 County Board meeting.**

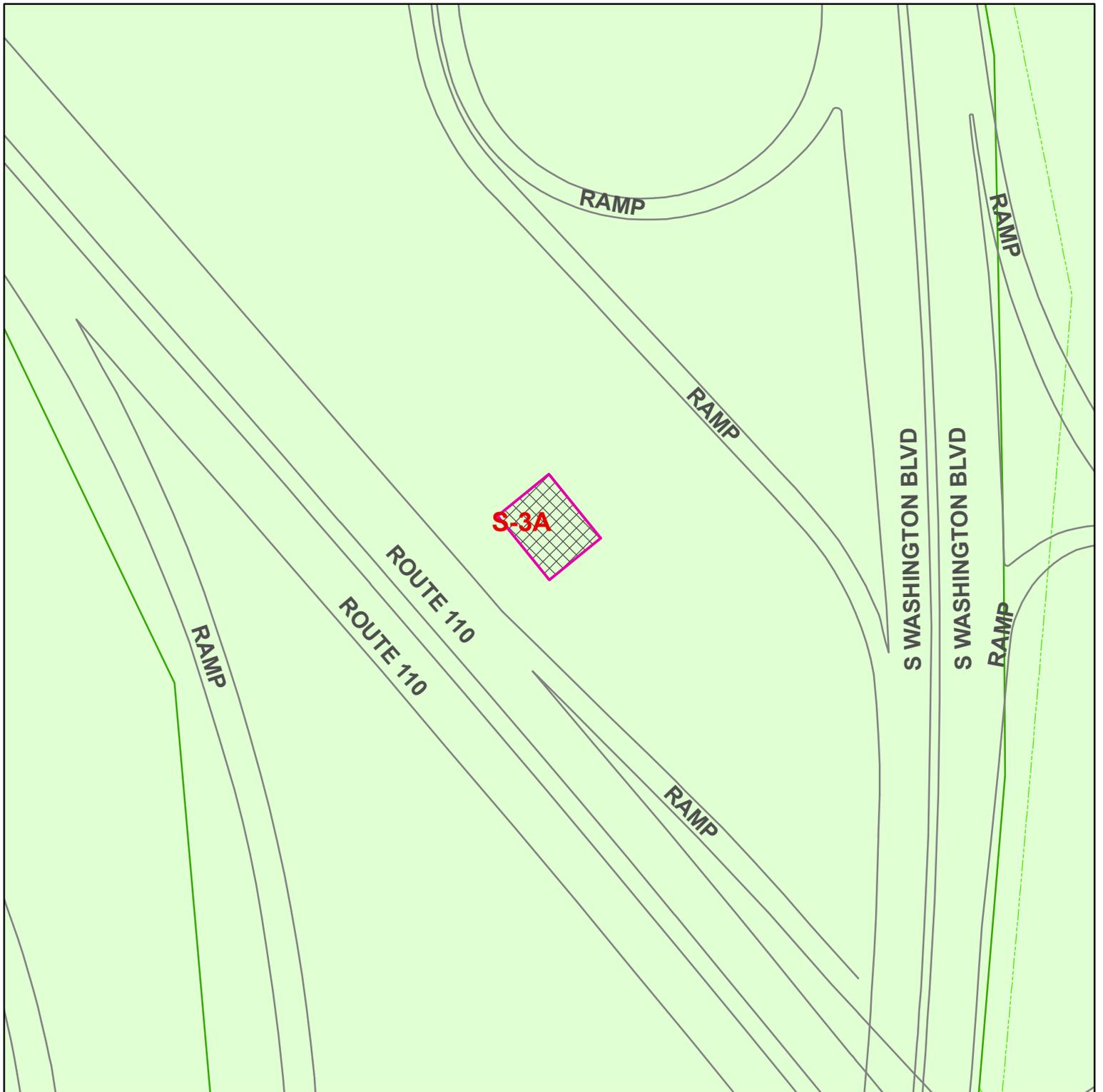
Thank you,  
Marco

**Marco Antonio Rivero**  
*Associate Planner*

<image001.png>

DEPARTMENT OF COMMUNITY PLANNING, HOUSING & DEVELOPMENT  
2100 Clarendon Blvd., Suite 700  
Arlington, VA 22201  
703.228.3525; 703-228-3572 (direct)  
[www.arlingtonva.us](http://www.arlingtonva.us) [mrivero@arlingtonva.us](mailto:mrivero@arlingtonva.us)

All correspondence sent to and from Arlington County Government is subject to the public record laws of the Commonwealth of Virginia.



**U-3340-12-1**

**Intersection of Jefferson Davis Hwy and Washington Blvd**

**RPC# 34-036-001 and 34-666-MET**



Location(s)

Scale: 1:1,200



Note: These maps are for property location assistance only.  
They may not represent the latest survey and other information.